DOCUMENT RESUME

ED 150 315	CE 014 442
AUTHOR	Rutherford, Andrew; And Others
TITLE	Prison Population and Policy Choices. Volume II: Technical Appendix.
INSTITUTION	Abt Associates, Inc. Cambridge, Mass.
SPONS AGENCY	Law Enforcement Assistance Administration (Dept. of Justice), Washington, D.C.
PUB DATE	Sep 77
CONTRACT	J-LEAA-018-77
NOTE	228p.; For a related document see CE 014 441
EDRS PRICE	MF-$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS	*Corrective Institutions; *Models; National Surveys; Population Trends; *Prisoners; *Statistical Analysis; *Trend Analysis

ABSTRACT

Contents of this research report appendix include a summary of the methodology employed for surveying corrections agencies and institutions during phase one and an outline of a Markov modeling exercise to be applied in phase two of the project. The Dynamic Correctional Planning Model is presented equation by equation in chapter 1 including sections on the police sector, court sector, sentencing sector, corrections sector, and prison capacity sector. The second chapter presents a validation of the correctional planning model. Chapter 3 describes the method used to survey corrections agencies and institutions, including survey forms used. Chapter 4 presents statistical data of results of the dynamic modeling exercise, and chapter 5 the statistical data of the results of the policy-blind projections, alphabetized by state. The concluding chapter presents the Markov Model, a statistical model of the flow of persons through the criminal justice system. (BL)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED150315

PRISON POPULATION AND POLICY CHOICES

Volume II:
Technical Appendix

Principal Authors:

Andrew Rutherford, Project Director
Peter Caines
Fanny G. Greber
Roger Levine
William A. Shaffer
Bradford Smith

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

This project was supported by Contract Number J-LEAA-018-77 awarded to Abt Associates Incorporated by the Law Enforcement Assistance Administration, U.S. Department of Justice, under the Omnibus Crime Control and Safe Streets Acts of 1968, as amended. Points of view or opinions stated in this document are those of the authors and do not necessarily represent the official position or policies of the U.S. Department of Justice.

September 1977

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY
CERIC

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

CE 014 442

NATIONAL INSTITUTE OF LAW ENFORCEMENT AND CRIMINAL JUSTICE

Blair G. Ewing, Acting Director

LAW ENFORCEMENT ASSISTANCE ADMINISTRATION

James M.H. Gregg, Acting Administrator

TABLE OF CONTENTS

PREFACE ix

DYNAMIC MODELING 1
  Overview of the Correctional Planning Model 1
  Police Sector 10
  Court Sector. 20
  Sentencing Sector 26
  Corrections Sector. 31
  Prison Capacity Sector 41

VALIDATION OF THE CORRECTIONAL PLANNING MODEL. 49

METHOD USED TO SURVEY CORRECTIONS AGENCIES & INSTITUTIONS. . 75
  Mail-out of Instruments 76
  Follow-up Procedures for Nonrespondents. 77
  Follow-up Procedures for Responders 78
  PC-1 and PC-2 Forms 80

RESULTS OF THE DYNAMIC MODELING EXERCISE 87

RESULTS OF THE POLICY-BLIND PROJECTIONS. 97

MARKOV MODEL OF THE CRIMINAL JUSTICE SYSTEM 151
  Introduction. 151
  The Construction of the Markov Model of the Criminal Justice System 152
  Weaknesses of the Markov Model. 157
  Attachment: Markov Chains with Feedback 157

LIST OF FIGURES AND TABLES

Figures

1.1 Feedback Controlling Prison Population Through Parole . . 3
1.2 Flow diagram showing movement of cases 5
1.3 Flow diagram showing movement of persons 6
1.4 Flow diagram showing facilities 8
1.5 Crime Test Input 11
1.6 Feedback Loops Generating Referrals of Police Cases To the Courts. 12
1.7 The Impact of Crime on Cases Processed as a Function of the Crime Ratio. 13
1.8 The Impact of Court Workload on Cases Referred to Court as a Function of the Court Workload 16
1.9 Feedback Loops Controlling Acquisition of Police. . . . 17
1.10 The Pressure to Acquire Police as a Function of the Relative Police Workload. 19
1.11 Feedback Loop Relating the Court Workload to the Court Cases Adjudged 21
1.12 Feedback Loops Controlling the Acquisition of Judges . . 24
1.13 The Pressure to Acquire Judges as a Function of the Relative Court Workload 25
1.14 The Impact of Workload on Fraction Imprisoned as a Function of the Court Workload. 29
1.15 The Impact of Crowding on Fraction Imprisoned as a Function of Prison Crowding Perceived by the Courts. . 30
1.16 Causal Loop Diagram of Feedback Between Parole and Prison Population 32
1.17 The Fraction of Former Prisoners Imprisoned as a Function of Detected Crimes Committed by Former Prisoners. 34
1.18 The Effect of Crowding on Sentence as a Function of the Crowding Perceived by Parole Authority 37

1.19 The Fraction of Plans Cancelled as a Function of the Crowding Perceived by Parole Authority 44
1.20 The Effect of Prison Crowding on Closings as a Function of the Crowding Perceived by Parole Authority. . . . 46

SET 1.A California-Comparison of Crimes, Court Cases Filed, and Court Commitments to Prison 54
SET 1.B Illinois-Comparison of Crimes, Court Cases Filed, and Court Commitments to Prison 55
SET 1.C Iowa-Comparison of Crimes, Court Cases Filed, and Court Commitments to Prison. 56
SET 1.D U.S. Federal-Comparison of Crimes, Court Cases Filed, and Court Commitments to Prison 57
SET 2.A California-Court Variables 58
SET 2.B Illinois - Court Variables 59
SET 2.C Iowa-Court Variables. 60
SET 2.D Massachusetts-Court Variables 61
SET 2.E U.S. Federal-Court Variables 62
SET 3.A California-Correctional Variables. 63
SET 3.B Illinois-Correctional Variables 64
SET 3.C Iowa-Correctional Variables. 65
SET 3.D Massachusetts-Correctional Variables. 66
SET 3.E U.S. Federal-Correctional Variables 67

6.1 154
6.2 160
6.3 160
6.4 161
6.5 162
6.6 165

Tables

1.1 Model Sectors and Factors Represented in Each Sector . . 4
1.2 Initial and Reference Years for California, Iowa, Illinois, Massachusetts, South Carolina, and Federal System. 9

2.1 Comparison of Prison Population for California 68
2.2 Comparison of Prison Population for Illinois. 69
2.3 Comparison of Prison Population for Iowa. 70
2.4 Comparison of Prison Population for Massachusetts . . . 71
2.5 Comparison of Prison Population for South Carolina . . . 72
2.6 Comparison of Prison Population for Federal System . . . 73

4.1 Prison Population for Base Run--Simple Flow Model. . . . 88
4.2 Prison Population for Base Run--Dynamic Modeling Approach. 88
4.3 Prison Population Under General Law and Order Scenario--Simple Flow Model. 89

4.4 Prison Population Under General Law and Order Scenario--Dynamic Modeling Approach. 89
4.5 Prison Population Under Reduced Imprisonment Rate Scenario--Simple Model Flow. 90
4.6 Prison Population Under Reduced Imprisonment Rate Scenario--Dynamic Modeling Approach. 90
4.7 Prison Population Under Mandatory Minimums--Personal Danger Scenario--Simple Flow Model. 91
4.8 Prison Population Under Mandatory Minimums--Personal Danger Scenario--Dynamic Modeling Approach. 91
4.9 Prison Population Under Persistent Offender Scenario--Simple Flow Model. 92
4.10 Prison Population Under Persistent Offender Scenario--Dynamic Modeling Approach. 92
4.11 Prison Population Under Determinate Sentencing Scenario--Dynamic Modeling Approach. 93
4.12 Prison Population Under Determinate Sentencing Scenario--Simple Flow Model. 93
4.13 Prison Population Under Judicial Intervention Scenario--Dynamic Modeling Approach. 94
4.14 Prison Population Under Prison Construction Scenario--Dynamic Modeling Approach. 94
4.15 Prison Population under Prison Alternatives Scenario--Dynamic Modeling Approach. 95

PRISONERS WITH SENTENCES OVER ONE YEAR

Federal System 98
Alabama 99
Alaska 100
Arizona 101
Arkansas 102
California 103
Colorado 104
Connecticut 105
Delaware 106
District of Columbia 107
Florida 108
Georgia 109
Hawaii 110
Idaho 111
Illinois 112
Indiana 113
Iowa 114
Kansas 115
Kentucky 116
Louisiana 117
Maine 118
Maryland 119
Massachusetts 120

Michigan . . . 121
Minnesota. . . . 122
Mississippi . . . 123
Missouri . . . 124
Montana . . . 125
Nebraska . . . 126
Nevada. . . . 127
New Hampshire . . . 128
New Jersey . . . 129
New Mexico . . . 130
New York . . . 131
North Carolina . . . 132
North Dakota . . . 133
Ohio . . . 134
Oklahoma . . . 135
Oregon . . . 136
Pennsylvania. . . . 137
Rhode Island. . . . 138
South Carolina . . . 139
South Dakota . . . 140
Tennessee. . . . 141
Texas . . . 142
Utah . . . 143
Vermont . . . 144
Virginia . . . 145
Washington . . . 146
West Virginia . . . 147
Wisconsin. . . . 148
Wyoming . . . 149

PREFACE

To facilitate the reader's understanding of the dynamic Correctional Planning Model, a brief explanation of DYNAMO is necessary. The equations in which the model is formulated are expressed in the notation of the DYNAMO language.[1] DYNAMO is an instrument designed to simulate the behavior of a system during a period of time by computing its variations at each time interval and by making corresponding adjustments.

The equations define five types of interrelated quantities:

- Levels, labeled with the letter L; these are accumulations of flows
- Rates, labeled with the letter R; these are the flows that enter and leave the levels
- Auxiliaries, labeled with the letter A; these are algebraic functions of the levels, defined for convenience and clarity in the course of modeling
- Initial values of levels, labeled with the letter N.
- Constants, labeled with the letter C

The levels, rates, and auxiliaries change over the course of the simulation in accordance with the relationships defined in the model equations; the constants and initial values do not change in a given simulation run.

A typical level equation takes the following form:

```
L    LEVEL.K = LEVEL.J + (DT)(RATE1.JK-RATE2.JK)
```

This equation says that the value of the level at the present instant (denoted by the subscript ".K") is equal to the value of the same level at the earlier instant (denoted by the subscript ".J"), plus the product of the length DT of the time intervening between instant J and instant K, multiplied by the net rate of flow into the level during that time period (denoted by the double subscript ".JK"). That net rate of flow is the difference between RATE1, an inflow, and RATE2, an outflow.

Rates are defined for the time period of length DT between the present instant .K and the subsequent instant .L; this period is denoted by the double subscript ".KL." For example:

```
R    RATE1.KL=LEVEL1.K*CONST1/AUX1.K
```

This equation says that the rate will be equal, over the next time increment, to the product of the present value of LEVEL1 and the constant CONST1, divided by the present value of the auxiliary AUX1.

Auxiliaries are defined at the present instant (K):

```
A    AUX1.K=AUX2.K+(AUX3*CONST2)
```

This equation says that the present value of the auxiliary AUX1 is equal to the sum of another auxiliary (AUX2) and the product of a constant (CONST2) and another auxiliary (AUX3).

Initial values are specified for the initial instant of the simulation only; they therefore have no time subscripts:

```
N    LEVEL=13500
```

This equation says that at the start of the simulation, the quantity called "LEVEL.K" has the numerical value 13500. Initial values can also be defined in terms of other quantities which have been defined as of the beginning of the simulation.

Constants do not change over the course of a simulation:

```
C    CONST1=0.77
```

This equation simply assigns the numerical value 0.77 to CONST1 for the duration of the simulation.

The algebraic relationships that define the rates, levels, auxiliaries, initial values, and constants constitute the structure and content of the model. In the following model description, each DYNAMO equation is presented together with a prose translation of its meaning in the context of the Correctional Planning Model. Each such relationship is an assumption about the nature of the criminal justice system, subject to criticism, refinement, and revision. Some of the relationships are tautological (prison populations are, beyond controversy, the accumulations of the flows into and out of them). Others are highly speculative and represent our best judgment as to the real-world relationships they reflect.

The constants and parameters of the model range from thoroughly empirical ones (prison populations as of 1970) to others with no direct existing evidence, and for which the best possible guesses have been made in this early formulation of the model. It is the experience of people who have worked with models of this kind that model behavior is typically insensitive, in a qualitative sense at least, to the precise value of most of its detailed parameters. The refinement of all the assumptions, and most particularly those to which the model is sensitive, is the task of further refinement of the model.

An example of an equation found in Chapter 1 is:

PL-3, A CPP.K=(RCPP)(ICRCP.K)
(Cases Processed Per Police)
(Cases/Person-Year)

The reading of this equation is:

- PL refers to sector of model, in this case, police sector.
- 3 refers to equation number.
- A refers to type of quantities or variables; in this case, Auxiliary.
- CPP is the name of dependent variable as defined in the context of the Correctional Planning Model.
- .K is time period of variable; in this case, current point of time.
- RCPP is the constant term defined by a later equation; no time period is indicated.
- ICRCP.K is independent variable measure in this equation at present time period.
- Cases Processed Per Police is the meaning of dependent variable.
- Cases/Person-Year is the unit of measure for dependent variable.

PREFACE NOTES

1. For details of DYNAMO language, the reader is referred to the DYNAMO User's Manual, by Alexander L. Pugh, III (MIT Press, Cambridge, Mass., 1976).

I. DYNAMIC MODELING

Overview of the Correctional Planning Model

Introduction

This section of the Technical Appendix describes the dynamic Correctional Planning Model. The majority of the discussion that follows will present the model equation by equation in an attempt to define for the readers the assumptions posited in the construction of the model. An awareness of the assumptions underlying the model is particularly important for those who utilize the results of the model, as the dynamic modeling methodology and the dynamo compiler are both sufficiently flexible to allow the possibility of modifying the model.

The Correctional Planning Model utilizes the methodology of system dynamics. System dynamics is a specific application of feedback system analysis to study business, economic, and social problems. Developed by Jay W. Forrester and his associates at the Massachusetts Institute of Technology, the concept has been applied to a wide range of problems such as regional economic development, urban growth and decline, criminal justice, and the growth in narcotics addiction.

The system dynamics practitioner analyzes a firm, a city, or a public institution as a system of flows of people, funds, goods, and information. These flows are controlled by an interrelated set of decisions. The analyst represents the flows and the decisions as equations in a computer language. This set of equations forms a model that can be manipulated by a computer to study the behavior of the system.

---

*Sensitivity testing, or testing of alternative assumptions in the model, is both desirable and possible. Although time constraints did not allow this type of testing to be performed in Phase I of the project, it is suggested that it be undertaken in Phase II.

A principal concept underlying the development of such a model is feedback. Feedback exists when the characteristics of a system lead to decisions affecting those characteristics, thereby influencing further decisions. Since decisions are not made in a vacuum, but in a net of information and pressures resulting from conditions in the real world, all decisions operate within one or more feedback loops.

Figure 1.1 depicts an example of a feedback loop showing parole in certain states like Massachusetts. In these states, parole tends to prevent extreme overcrowding in state institutions. The arrows in the diagram indicate causal relations among factors. As the prison population begins to rise above capacity, the parole board seeks to parole more prisoners. This action tends to reduce the prison population. If nothing else occurs to raise the population, the pressure for parole would be relieved, and parole would be reduced.

As described below, many interlocking feedback loops exist in the criminal justice system. Understanding their operation is important for the following reasons:

- Feedback loops govern the dynamic behavior of the system. The way a system changes through time often depends on the arrangements of the feedback loops.

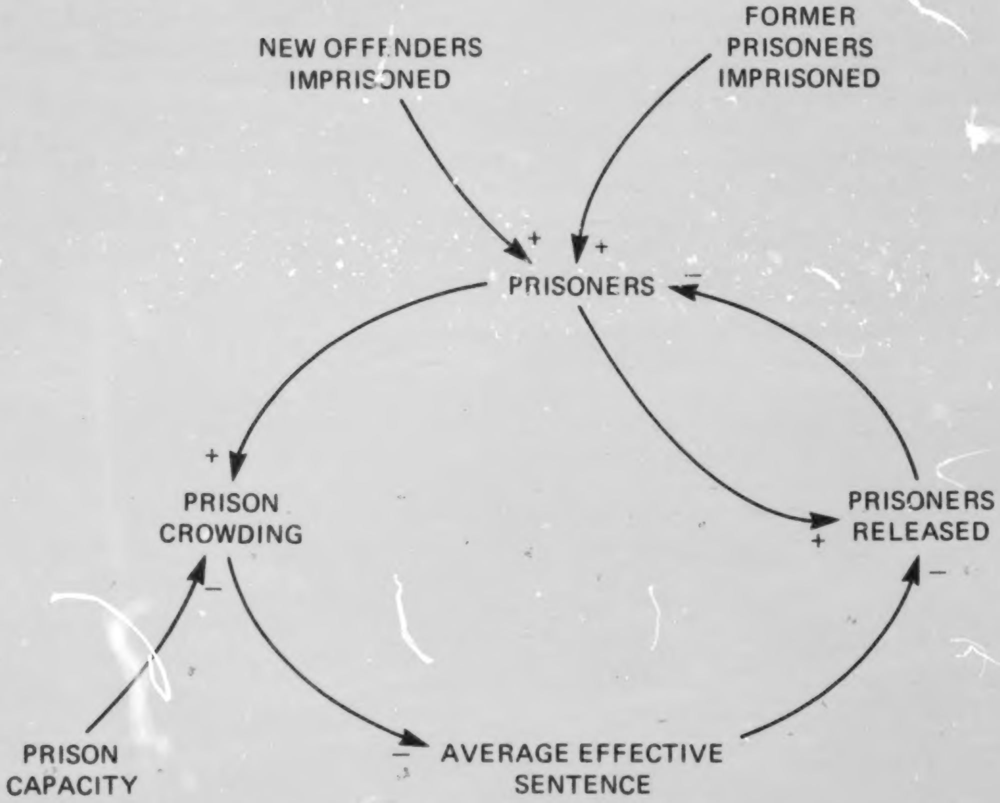
- Although a shift in policy may create an initial effect, the multiloop systems frequently adjust to counteract the policy changes.

- Multiloop systems usually contain leverage points, where policies can be particularly effective. However, their location is not always obvious.

Within a feedback loop, three types of variables exist: levels, rates, and auxiliaries. Levels are accumulations. Prison population, court-case backlog, and police manpower are examples of levels. Rates are flows affecting the levels. Crimes reported, cases adjudged, and offenders imprisoned are examples of rates. Auxiliaries represent the information and policy structure in the system. From the model's viewpoint, a policy is a statement of how information about the levels affects the rates. Auxiliary variables compute these effects. For example, in the parole feedback described in Figure 1.1, the impact of the level, prison population, on the rate, prisoners released, is a policy in the system and would be computed using the auxiliary variables prison crowding and impact of crowding on parole.

Figure 1.1

Feedback Controlling Prison Population Through Parole*


NEW OFFENDERS IMPRISONED
FORMER PRISONERS IMPRISONED
+
+
PRISONERS
−
+
PRISON CROWDING
PRISONERS RELEASED
+
−
−
PRISON CAPACITY
−
AVERAGE EFFECTIVE SENTENCE

* NOTE: All feedback loop figures stress the circularity inherent in the modeling technique. Throughout the figures showing feedback loops, + refers to increases and - refers to decreases.

The feedback loop is a principal concept behind the system dynamics approach to modeling, and any discussion of policy scenarios will entail a simultaneous discussion of both primary and secondary policy impacts. At times, this approach may appear confusing and even circular to the reader. For this reason, a technique called "brute force analysis" has been included as part of Chapter 6 telling the reader what the primary policy impact might be in each scenario were all feedback loops made inoperative.

Model Organization

As indicated in Table 1.1, the model is divided into five sectors. The Police Sector takes as its input an exogenously supplied crime rate. The sector contains assumptions about the flow of cases referred to court. The Court Sector determines the adjudication of cases in the model. The Sentencing Sector contains assumptions about the fraction of defendants imprisoned and the maximum and minimum court-imposed sentences. The Corrections Sector determines the prison population, the release of prisoners, and average sentence served. The Prison Capacity Sector contains the assumptions about construction and obsolescence of correctional facilities.

Table 1.1

Model Sectors and Factors Represented in Each Sector

1. Police Sector:	Crimes Police Cases Processed Police Cases Referred to Court Number of Police
2. Court Sector:	Cases Adjudged Number of Judges
3. Sentencing Sector:	Minimum and Maximum Court-imposed Sentences Impact of Sentence Severity on Processing Cases Fraction of Cases Resulting in Imprisonment
4. Corrections Sector:	Offenders Imprisoned Prisoners Average Time Served Returns from Parole
5. Prison Capacity Sector:	Current and Obsolete Facilities Construction of Facilities New Plans for Facilities Closing Facilities Court-mandated Changes in Facilities Federal Construction Program

Model Flows

Another method of viewing the model is to consider the various types of flows. This model includes flows of criminal cases, flows of persons, and flows of facilities. Figure 1.2 depicts the flows of cases in the model. In the Police Sector, a fraction of crimes form the flow of police cases referred to court. This inflow adds to the court workload. Dismissals, guilty pleas, and trials (not shown separately) form the cases adjudged that decrease the case backlog.

Figure 1.2

Flow diagram showing movement of cases. Rectangles are levels, valve symbols are rates.

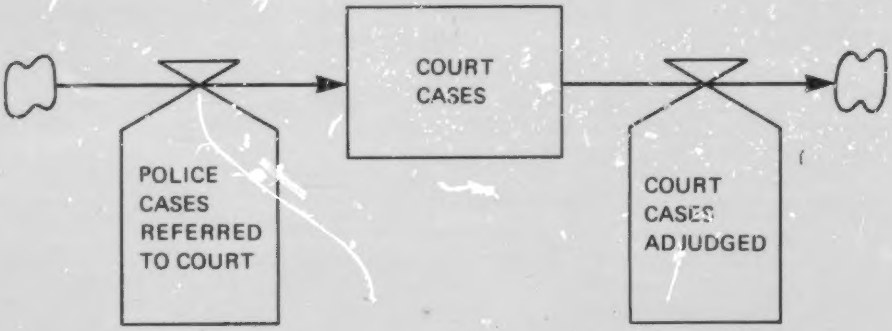


Figure 1.3 depicts the flow of persons in the model. The model comprises two categories of individuals: prisoners and former prisoners. A third category of persons, new offenders, is not explicitly represented, although the flow of new offenders into prison is represented. New offenders are defined, for the purposes of this model, as persons who have committed crimes but have no prior prison record. New offenders imprisoned and former prisoners imprisoned increases the level of prisoners. Former prisoners imprisoned includes former prisoners both sentenced by the courts and returned to prison for parole violations. Prisoners released decreases the level of prisoners and increases the number of former prisoners. Aging out of former prisoners represents the reduction in former prisoners through deaths and aging. As a former prisoner ages he is assumed to lose the characteristic of a former prisoner, thereby dropping out of the former-prisoner category.

Figure 1.3

Flow diagram showing movement of persons.

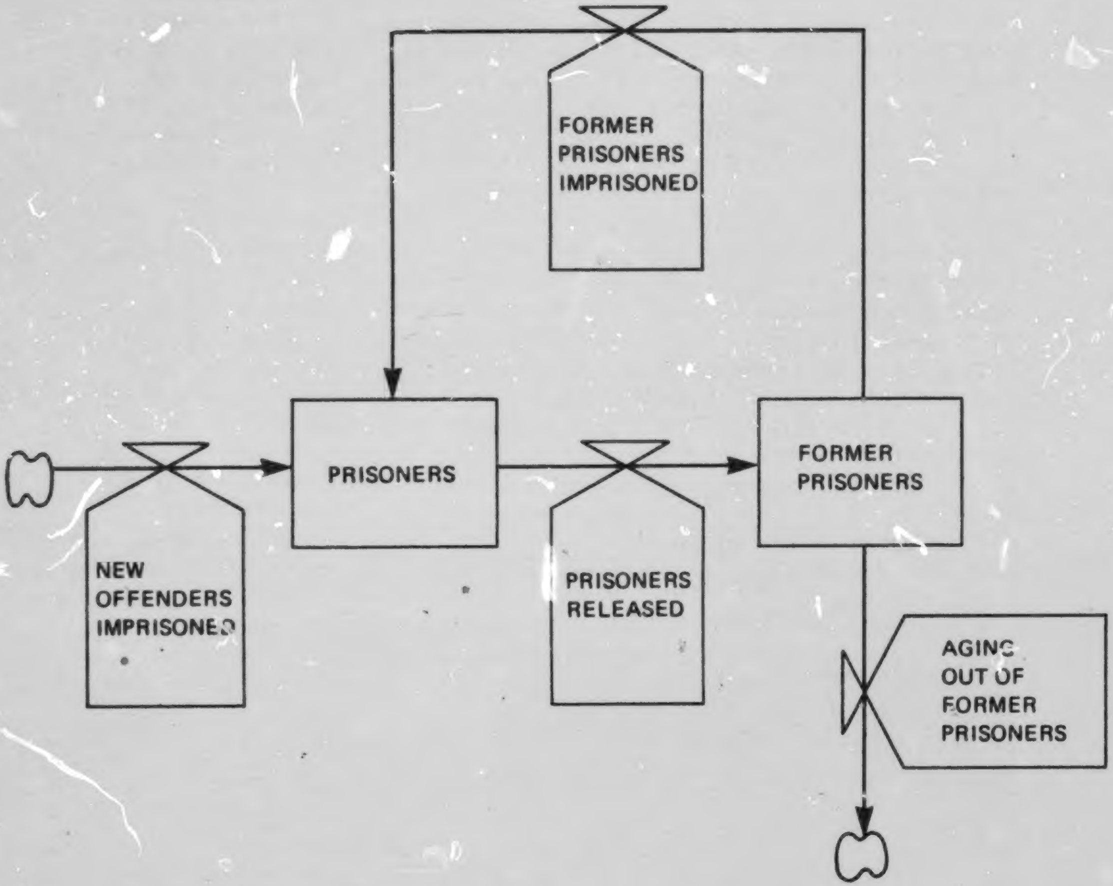

FORMER
PRISONERS
IMPRISONED
PRISONERS
FORMER
PRISONERS
NEW
OFFENDERS
IMPRISONED
PRISONERS
RELEASED
AGING
OUT OF
FORMER
PRISONERS

Figure 1.4 depicts the levels for prison facilities. The first level is facilities in planning, facilities that are under consideration. New plans for facilities add to this level. As facilities are constructed, the number of facilities in planning decreases, and the number of current facilities increase. As facilities age, they move into the obsolete-facilities category. Closed facilities then reduce that level.

Parameters

The Correctional Planning Model includes a number of parameters, some derived from published data, others estimated from descriptive information, experts, and the literature. The model, described in the following pages, is calibrated for the State of California. In subsequent analysis with the model, parameters are adjusted to reflect conditions in other States under investigation.

In selecting parameters, the model uses data for two years. The first year is the initial year, or the starting point of the model. The choice of the initial year for any State weighed three main factors: that enough time be allowed for sufficient data points to estimate model parameters and to establish dynamic relations of the model; that the period under consideration not have experienced any major institutional change that would affect model predictions; and that State data be available. In California, the year 1955 met these criteria. In some of the other States analyzed, the data were not available for 1955 so that another year had to be chosen. For the Federal System, 1955 was found to be an atypical year from the point of view of corrections, and hence 1960 was chosen as the initial year. The second key year for purposes of the model is the reference or base year. Many of the model relations are built around the reference year. For California, 1970 is used as the base year. The discussion in later chapters provides several examples of "reference values." Table 1.2 lists the initial and reference years for the six jurisdictions applying to the model.

Figure 1.4

Flow diagram showing facilities.

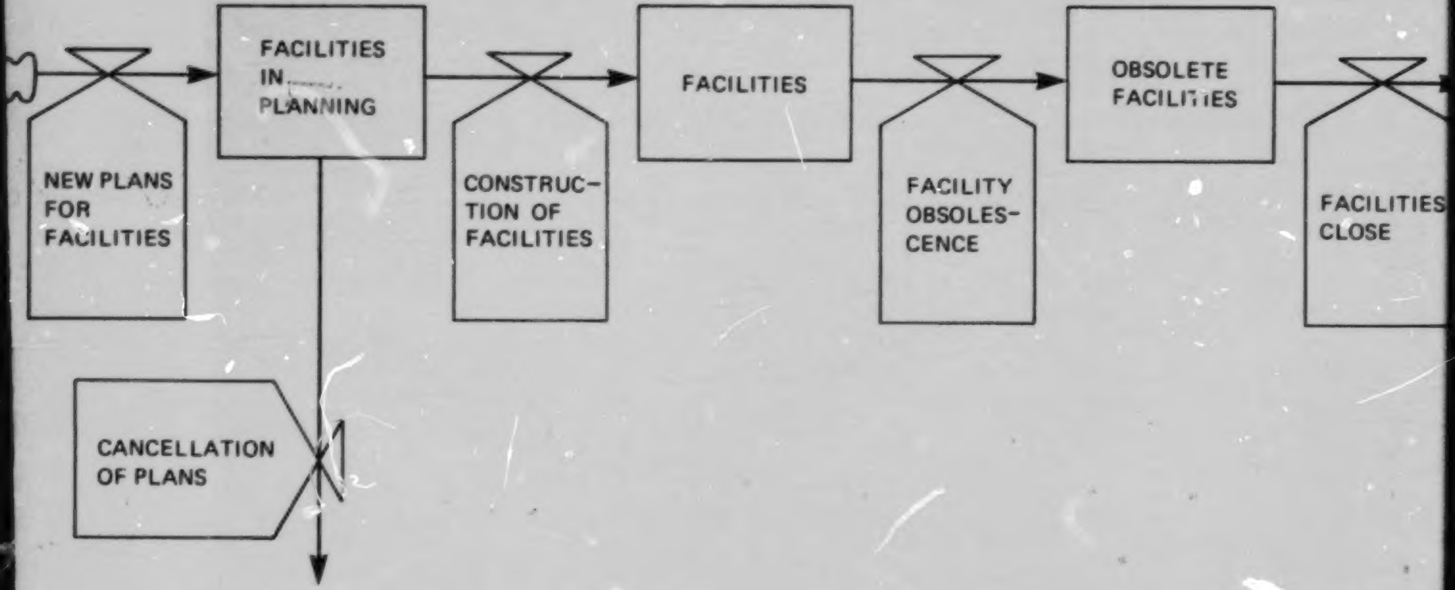

FACILITIES IN PLANNING
FACILITIES
OBSOLETE FACILITIES
NEW PLANS FOR FACILITIES
CONSTRUCTION OF FACILITIES
FACILITY OBSOLESCENCE
FACILITIES CLOSE
CANCELLATION OF PLANS

Table 1.2

Initial and Reference Years for California, Iowa, Illinois, Massachusetts, South Carolina, and Federal System

Jurisdiction	Initial Year	Reference Year
California	1955	1970
Iowa	1956	1975
Illinois	1961	1973
Massachusetts	1955	1970
South Carolina	1974	1976
Federal	1960	1970

Model Limitations

Within the Correctional Planning Model, several limitations exist affecting its uses. First, the model does not examine all factors influencing the size of prison population. The main emphasis is focused towards elements influenced by the criminal justice system.

Second, the model is highly aggregated, compromising the need to simplify the problem and to adequately represent the system under study. Disaggregation and refinements can be added as time permits.

Third, the model makes some assumptions that are difficult to measure. Those working with the model must use their own discretions and knowledge of the field to estimate parameters. The result is to change the locus of interest in the model from direct forecasting of quantities at set points in the future to the analysis of policy questions of current interest. Thus, the intention of the model is to lead to an understanding of the effect policies and assumed relations have on the behavior of the criminal justice system, not to give accurate projections of quantities at future set points.

Organization of Description

The remainder of this description is divided into five sections, one for each sector of the model. Following an overview of the sector, the individual equations given in the DYNAMO computer language are described. Since the emphasis of this appendix is simply to present the assumptions of the model, the relevant literature discussing the assumptions has been cited only occasionally.

Police Sector

Introduction

This section on the Police Sector, along with the following section on the Court Sector, explore the assumptions and the equations of the model which deal with the processing of cases. Feedback loops to be discussed in the Police Sector section control both the referral of cases to the courts and the size of the police force.

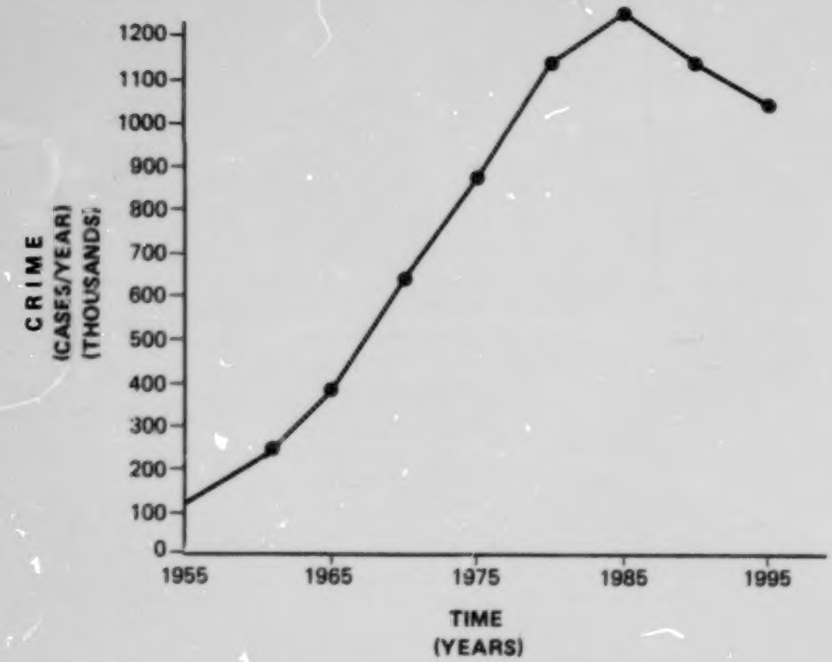
Crimes

The volume of crime is an exogenously generated variable in the model (see Equation PL-1). In Figure 1.5, the pattern of crime employed for the model runs is shown. Values through 1975 are based on historical data for the State of California. The volume of crime is then assumed to increase 30 percent over its 1975 level by 1980. An additional 10-percent increase above the 1980 level is projected by 1985. Thereafter, the volume of crime is assumed to decline, returning to the 1980 level by 1990 and experiencing a further decline of 10 percent by 1995.

The assumed behavior of the volume of crime is not to be viewed as a projection, but as a test input to see how the model behaves when subjected to a moderate increase in the volume of crime followed by a decline. DYNAMO permits the model user to substitute alternative test inputs to view the sensitivity of prison population to changes in crime.

Figure 1.5

Crime Test Input



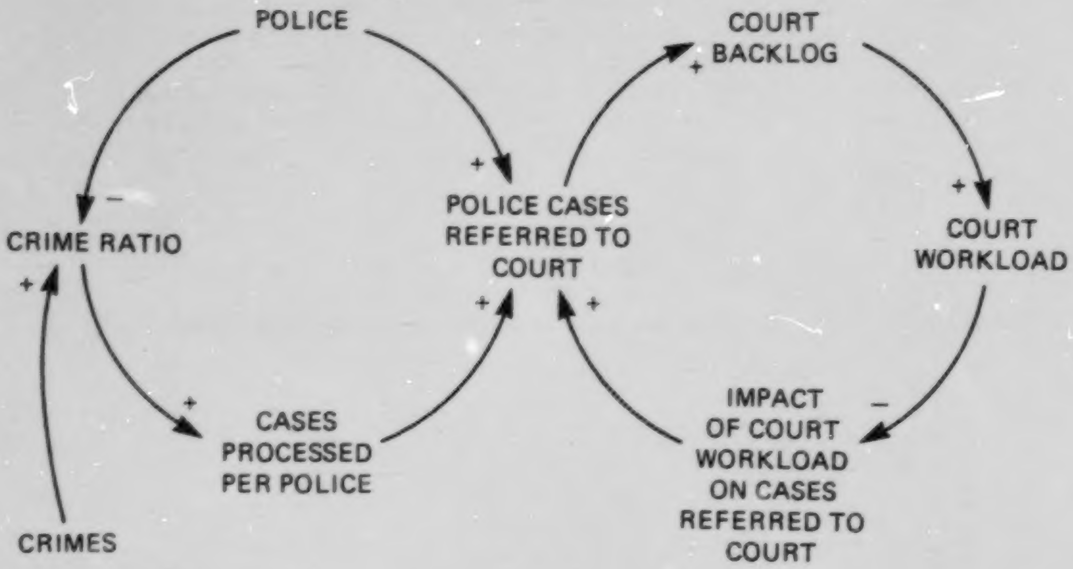
```
PL-1,A      Crime.K = TABLE (TCRIME, TIME.K, 1955, 1995, 5)
                      Crimes (cases/year)

PL-1.1,T    TCRIME = 138E3/251E3/386E3/652E3/876E3/1138E3/
                     1252E3/1138E3/1035E3
                     Table for crime
```

Police Cases Referred to Court

Figure 1.6 depicts the feedback loops controlling the referral of cases to the courts. This flow depends on both the demands placed on police and on the courts. Taking the role of the police first, police cases referred to court are the number of police times the cases processed per policeman. Cases processed per police is assumed to depend on the crime ratio, or the ratio of crimes (known to the police) over the number of police.

Figure 1.6

Feedback Loops Generating Referrals of Police Cases to the Courts


POLICE
COURT BACKLOG
+
+
+
CRIME RATIO
−
POLICE CASES REFERRED TO COURT
COURT WORKLOAD
+
+
+
+
CASES PROCESSED PER POLICE
IMPACT OF COURT WORKLOAD ON CASES REFERRED TO COURT
−
CRIMES

The impact of court overloading is depicted in the right half of Figure 1.6. As the police cases referred to court raise the court backlog. the court workload (backlog relative to the number of judges) increases, producing congestion in the courts. Prosecutors or judges are presumed to try to limit cases entering the courts.

In equation PL-2, police cases referred to court (PCRCT) is the product of the number of police officers (POLCE), the cases processed per police (CCP), and the impact of court workload on cases referred to courts (ICWC).

```
PL-2, R    PCRCT.KL = (POLCE.K)(CCP.K)(ICWC.K)
                      Police cases referred to court (cases/year)
```

Cases processed per police (CCP) in Equation PL-3 is, in turn, the product of the reference cases processed per police and the impact of crime on cases processed (ICRCP). Reference cases processed per police (RCPP) is estimated by dividing the flow of cases into court (for California, the Superior Court) by the number of police for the reference year.

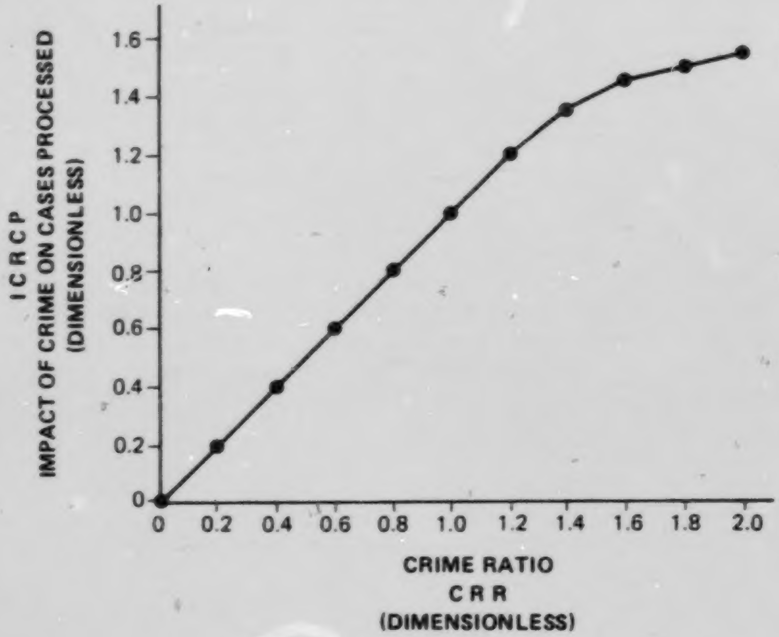
PL-3,A   CPP.K = (RCCP)(ICRCP.K)
Cases processed per police (cases/person-year)

PL-3.1,C   RCCP = 1.5
Reference cases processed per police
(cases/person-year)

Figure 1.7 depicts the relation between the crime ratio (see CRR in Equation PL-5) and the impact of crime on cases processed. The crime ratio is the ratio of crimes to police, normalized by dividing by the reference ratio of crimes to police (RRCRP). The reference ratio of crimes to police is derived by dividing crimes known to police by the number of police for the reference year. Normalizing causes the ratio to vary around the convenient number one.

Figure 1.7

The Impact of Crime on Cases Processed as a Function of the Crime Ratio



PL-4,A   ICRP.K = TABLE (TICRCD, CRR.K, 0, 2, 0.2)
Impact of crime on cases processed
(dimensionless)

PL-4.1,T TICRCD = 0.00/0.20/0.40/0.60/0.80/1.00/1.20/1.35/
1.45/1.50/[illegible].55
Table for impact of crime on cases processed

PL-5,A CRR.K = (CRIME.K/POLCE.[illegible]/RRCRP
Crime ratio (dimensionless)

PL-5.1,C RRCRP = 14
Reference ratio of crimes to police
(cases/person-year)

For values of CRR ranging from zero to one, the impact of court workload on cases referred to court (ICWC) is nearly a linear function of the crime ratio. As a simple example shows, this linearity implies that in this range the number of police officers has little impact on the flow of cases to the court. Suppose the crime ratio is one, and the number of police doubles--this means that the variable POLCE in Equation PL-2, determining the number of police cases referred to the court, doubles. But as the crime ratio (CRR) is also a function of the number of police officers (see Equation PL-5), the crime ratio is halved. The result is that the impact of crime on cases processed (see Equation PL-4), which is nearly a linear function of the crime ratio, is also halved, thereby halving cases processed per police (see CPP in Equation PL-3). If we then multiply the number of police (POLCE) by the number of cases processed per police (CPP), we find no change. Hence the police cases referred to court (see PCRCT in Equation PL-2) remains constant, demonstrating the proposition that where the values of the crime ratio lie in the range from zero to one, the size of the police force has little impact on the flow of cases to the court.

The relationship between variations in police productivity and the size of the police force has not been satisfactorily resolved in empirical studies, although some evidence does exist to substantiate the assumed relation between police and apprehension. Riccio states:

> An analysis was performed on the data in an attempt to determine which had a greater influence on the absolute number of arrests--the number of sworn officers or the number of reported Part 1 crimes. This effort attempted to determine if arrests were more closely related to a measure of the workload or potential opportunities for apprehension. That analysis proved unsuccessful...But..., from an apprehension productivity standpoint, for the 27 cities studied with all other conditions as they were large drops in apprehensions productivity are

> highly related to large increases in resource input and that significant increases in apprehension productivity are related to little or no increases in number of sworn officers.[1]

If the crime ratio (CRR) is greater than one, the impact of crime on cases processed starts to level off, reflecting diminishing returns. That is, as the crime ratio increases above one, increases in levels of crime will not meet with a corresponding increase in the number of cases processed by the court, reflecting the existence of a fixed factor--police. Although it is difficult to ascertain from the empirical evidence where the point of diminishing returns sets in, that it must can be logically ascertained from behavioral evidence. The variable impact of court workload on cases referred to the courts (ICWC of Equation PL-6) measures the extent to which judges or prosecutors influence the flow of cases into the general trial courts. As such it is a function of the level of workload being experienced by the trial courts of general jurisdiction. Figure 1.8 depicts the relation between ICWC and the court workload CTWL. CTWL, discussed in more detail in the next section, is the ratio of the court backlog to the number of judges, normalized by the reference ratio of cases to judges. By definition, court workload is equal to one in the model. When this occurs, variable ICWC is found to be equal to one; and therefore, the court workload exerts no influence on the flow of cases.

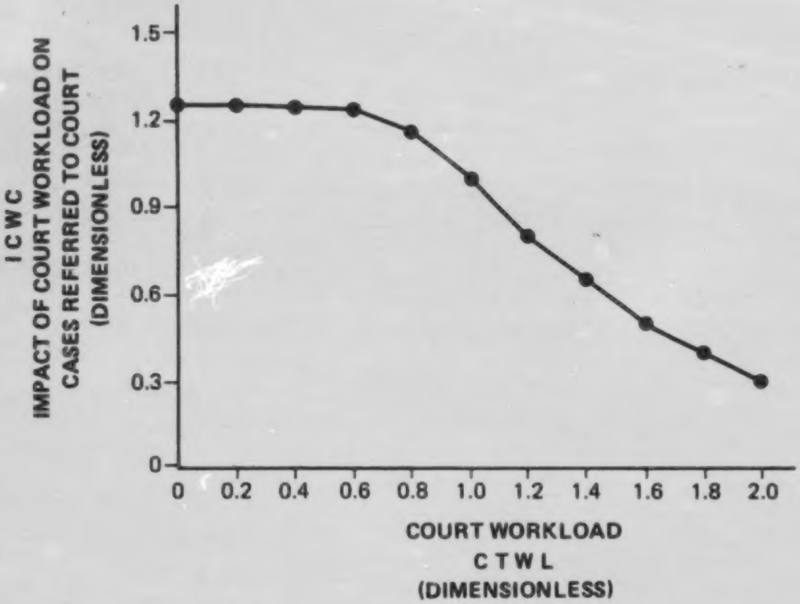
As workload climbs to 20 percent above the reference condition, cases referred to court are assumed to decline by 20 percent. Further increases in workload result in additional downward pressure on referrals, though the effect is less than proportional to the rise in workload. Reductions in court workload below the reference level are not assumed to exert a very substantial influence on police referrals. For example, it is assumed that a total absence of court workload would result in only a 26-percent increase in referrals.

PL-6 ICWC.K = TABLE (TICWC, CTWL.K, 0, 2, 0.2)
Impact of court workload on cases referred to court (dimensionless)

PL-6.1 TICWC = 1.26/1.26/1.25/1.24/1.18/1.00/0.80/0.65/0.50/0.40/0.30
Table for impact of court workload on cases referred to court

Figure 1.8

The Impact of Court Workload on Cases Referred to Court as a Function of the Court Workload

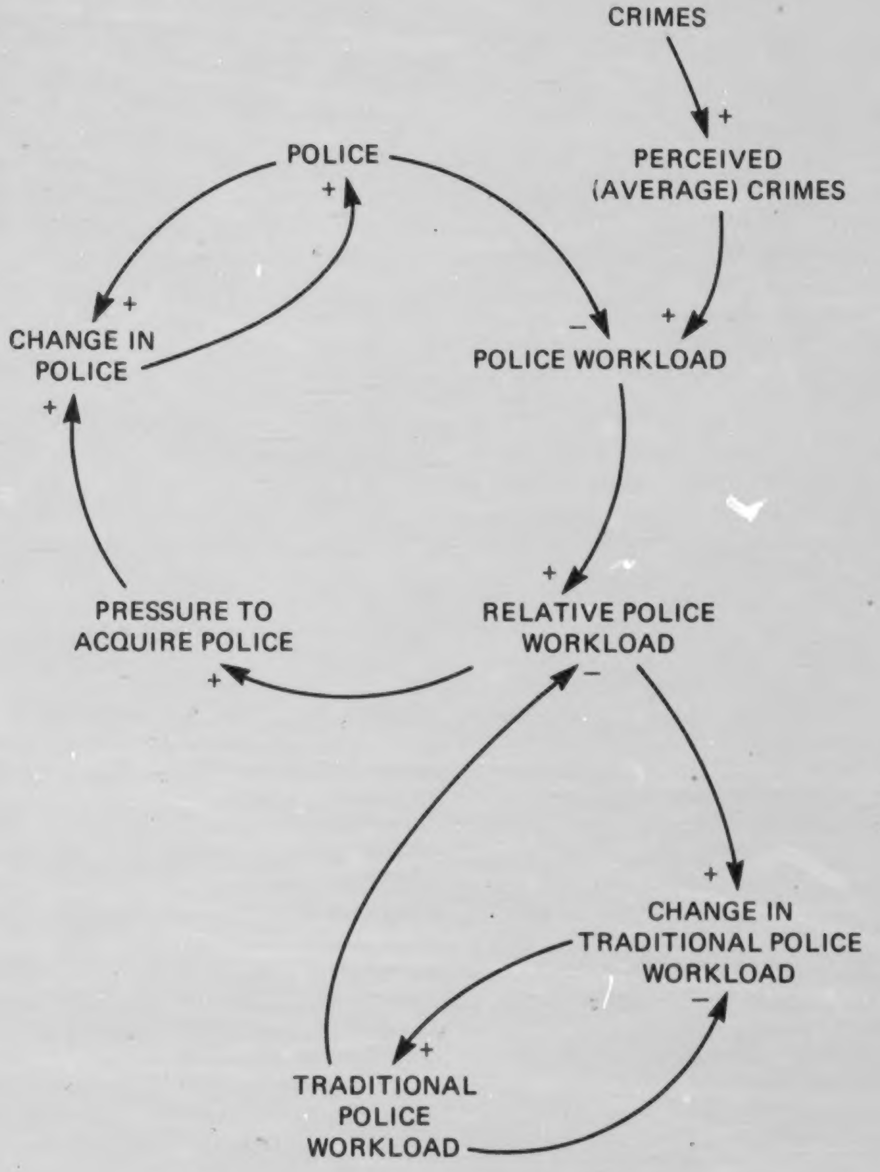


Police

As crime increases, pressures build to increase the size of the police force. Figure 1.9 depicts the feedback loops controlling the acquisition of police. A central variable in these feedback loops is the relative police workload. Similar to the crime ratio, the relative police workload (RPWL) compares the police workload to the traditional police workload. The traditional workload is a standard for evaluating whether the actual police workload is "above normal," thus justifying more police. Like standards in other organizations, the traditional police workload is probably based on past history. If the actual workload remains above the traditional workload for a substantial period of time, expectations are assumed to change and hence the traditional workload will rise to meet the higher expectations. The speed with which expectations adjust to the new reality will determine whether the higher workload produces an increase in the size of the police force or an increase in the workload of the existing force.

Figure 1.9

Feedback Loops Controlling Acquisition of Police


CRIMES
+
PERCEIVED (AVERAGE) CRIMES
POLICE
+
+
CHANGE IN POLICE
–
+
POLICE WORKLOAD
+
+
PRESSURE TO ACQUIRE POLICE
RELATIVE POLICE WORKLOAD
+
–
+
CHANGE IN TRADITIONAL POLICE WORKLOAD
–
+
TRADITIONAL POLICE WORKLOAD

The variable POLCE in Equation PL-7 is a level representing the number of policemen and is regulated by the variable CPOLCE (a flow) measuring changes in size of the police force. The initial value of POLCE, IPOLCE, which measures the existing size of the police force in the initial year, is calculated from State data.

```
PL-7,L     POLCE.K = POLCE.J+(DT)(CPOLCE.JK)

PL-7.1,N   POLCE = IPOLCE
                   Police (persons)

PL-7.2,C  IPOLCE = 25000
          Initial police (persons)
```

The change in the size of police force (CPOLCE) in Equation PL-8 is a function of the number of police and of the pressures to acquire more police as measured by the variable PAPOL.

```
PL-8,R     CPOLCE.KL = (POLCE.K)(PAPOL.K)
                       Change in police (persons)
```

PAPOL in Equation PL-9 is the fractional annual increase in the size of the police force as determined by the relative workload. Figure 1.10 depicts the relation between the relative workload and PAPOL. When the relative workload is one, PAPOL is zero, resulting in a no growth in the size of the police force. As the workload increases, the pressure to add capacity increases.

```
PL-9,A     PAPOL.K = TABLE (TPAPOL,RPWS.K,0,3,0.5)
                     Pressure to acquire police (1/year)

PL-9.1,T   TPAPOL =  -0.050-0.025/0.000/0.030/0.060/0.100/0.150
                     Table for pressure to acquire police
```

The relative police workload (RPWL) in Equation PL-6 is the ratio of the actual police workload (PWL) to the traditional police workload (TPWL).

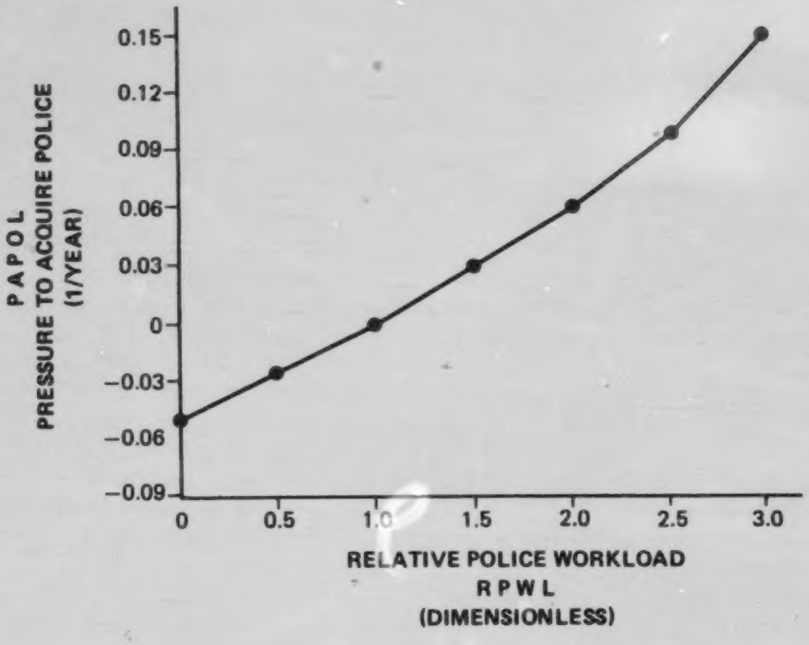
```
PL-10,A    RPWL.K =  PWL.K/TPWL.K
                     Relative police workload (dimensionless)
```

Equation PL-11 determines the variable PLW. PLW is the ratio of perceived crime (PCRIME) relative to the size of the police force, normalized by dividing by the reference ratio of crimes to police (RRCRP).

```
PL-11,A    PWL.K =   (PCRIME.K/POLCE.K)/RRCRP
                     Police workload (dimensionless)
```

Figure 1.10

The Pressure to Acquire Police as a Function of the Relative Police Workload



Equation PL-12 computes the variable perceived crime (PCRIME). The equation computes an adjusted moving average. In doing so, it filters out short-term fluctuations in crime as manpower acquisition is assumed to be influenced more by the long-term changes than short-term fluctuations.

PL-12,L PCRIME.K = PCRIME.J+(DT/CPT)(CRIME.J-PCRIME.J)

PL-12.1,N PCRIME = CRIME
Perceived crime (cases/year)

PL-12.2,C CPT = 3
Crime perception time (year)

Equation PL-13 determines the variable TPWL, which measures the level of traditional police workload. As such, TPWL is a function of the existing standards for a traditional workload and changing standards regarding what constitutes a traditional workload for that police force. The latter is a flow measured by the variable CTPWL which is determined by Equation PL-14. CTPWL is, in turn, a function of the existing standards for the traditional police workload as measured by TPWL and the relative workload (RPWL). Equation PL-14 stipulates that as the relative workload increases, expectations of police will shift to make their new standards of traditional workload consistent with the present reality. How quickly the adjustment period is will be determined by the model parameter PTAT measured in equation PL-15.

PL-13,L TPWL.K = TPWL.J+(DT)(CTPWL.JK)

PL-13.1,N TPWL = PWL
Traditional police workload
(dimensionless)

PL14,R CTPWL.KL = (TPWL.K)(RPWL.K-1)/PTAT
Change in traditional police workload
(dimensionless)

PL14.1,C PTAT = 10
Police tradition adjustment time (years)

Court Sector

Introduction

In this section discussion regarding assumptions made by the model about the processing of cases will be completed. The feedback loops which control the processing of cases through the court system will be introduced.

Cases Processed

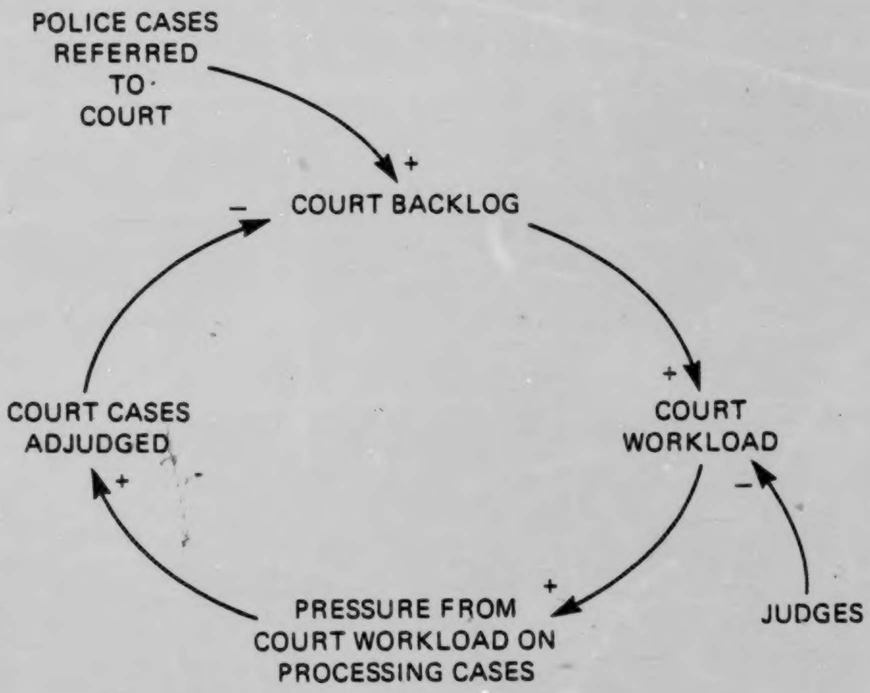
Figure 1.11 depicts the feedback loop relating the court workload to the court cases adjudged.

The variable CTBCK (court backlog as represented in equation CT-1) measures the stock of cases awaiting processing by the courts. Equation CT-1 determines CTBCK as an iterative process. The initial value of CTBCK is determined by multiplying the number of judges hearing cases in the initial period (as measured by the variable IJUDGE) by the ratio of cases to number of judges in this period (as measured by the variable IRCJ). Both of these variables are computed from State data. The stock is then adjusted to account for increases in the cases referred to the court by the police (PCRT discussed in the section dealing with the Police Sector) and the number of cases referred to the court rather than to the parole board (ACFRP discussed in the Corrections Sector section), and decreased by court cases adjudged (CTADJ).

```
CT-1,L      CTBCK.K = CTBCK.J+(DT)(PCRCT.JK-CTADJ.JK+ACFRP.JK)

CT-1.1,N    CTBCK =   (IJUDGE)(IRCF)
                      Court backlog (cases)

CT-1.2,C    IRCJ  =   22
                      Initial ratio of cases to judges
                      (cases/person)
```

Figure 1.11

Feedback Loop Relating the Court Workload to the Court Cases Adjudged


POLICE CASES REFERRED TO COURT
+
COURT BACKLOG
–
+
COURT WORKLOAD
–
COURT CASES ADJUDGED
+
+
PRESSURE FROM COURT WORKLOAD ON PROCESSING CASES
JUDGES

Court cases adjudged (variable CTADJ in Equation CT-2) represent the total cases processed by the courts, including trials, dismissals, and guilty pleas. CTADJ is the product of the number of judges (JUDGE), the reference cases processed per judge RCPJ, and the pressure from court workload on processing cases PCWP. The reference cases processed per judge (RCPJ) is derived from State data.

```
CT-2,R       CTADJ.KL = (JUDGE.K)(RCPJ)(PCWP.K)
                        Court cases adjudged (cases/year)

CT-2.1,C     RCPJ = 130
                    Reference cases processed per judge
                    (cases/person-year)
```

Equation CT-3 determines the variable PCWP or the pressure from court workload on processing of cases. This variable represents the increase in cases processed as a result of pressures from backlog of cases. The court workload (CTWL in Equation CT-4) is the ratio of the court backlog (CTBCK) to the number of judges (JUDGE). The ratio is normalized by dividing by the reference ratio of cases to judges (RRCJ). The latter is derived from State data for the base year. When the variable CTWL is equal to one, the variable PCWP is also equal to one and therefore has no impact on court cases adjudged. As the workload increases, the variable PCWP increases, producing an increase in cases adjudged. This may happen because judges spend more time handling criminal cases, because some judges may be transferred from the civil bench to the criminal bench, or because more cases will be dismissed.

```
CT-3,A       PCWP.K = STABLE (TPCWP1, TPCWP2, CTWL.K,0,2,0.2)
                      Pressure from court workload on processing
                      cases (dimensionless)

CT=3.1,T     TPCWP1 = 0.00/0.45/0.70/0.84/0.92/1.00/
                      1.02/1.04/1.06/1.08/1.10
                      First table for pressure from court work-
                      load on processing cases

CT-3.2,T     TPCWP2 = 0.00/0.45/0.70/0.84/0.92/1.00/
                      1.02/1.04/1.06/1.08/1.10
                      Second table for pressure from Court work-
                      load on processing cases

CT-4,A       CTWL.K = (CTBCK.K/JUDGE.K)/RRCJ
                      Court workload (dimensionless)

CT-4.1,C     RRCJ =   130
                      Reference ratio of cases to judges
                      (cases/judge)
```

Massachusetts is a good example of the process described by the model. Massachusetts has pursued a policy of moving judges from the civil bench to the criminal bench as the backlog of criminal cases has mounted. As a result, the number of days devoted to criminal trials per judge has increased. Also, a lar[illegible] fraction of cases have been dismissed. It should be note[illegible]r, that the principal means of moving cases faster is plea bargaining. A high workload places judges and prosecutors under pressure to move cases faster. The model assumes that judges will grant more lenient sentences (see Sentencing Sector below) in exchange for settling cases more promptly.

According to former Manhattan District Attorney Richard Kug, "In the last decade, judges have become overly concerned with volume. The simplest thing to do is to wave bait and give light sentences. It isn't even done consciously. The pattern has developed because of the large case load." In addition, Bronx District Attorney M. Marola reported: "Anytime there's a plea negotiation and the defendant's lawyer knows we don't have the capacity to try the case, then the defendant gets a better deal."[2]

Equation CT-3 utilizes the switch-table function STABLE. This function operates like the TABLE function, except it uses the first table (in this case, TPCWPL) for years prior to 1978 (in the model simulation); and for 1978 and thereafter, it uses the second table (TPCWP2). In the original model, the two tables are identical, but in the reruns for the scenarios, the second table is changed to represent changes in policy.

Judges

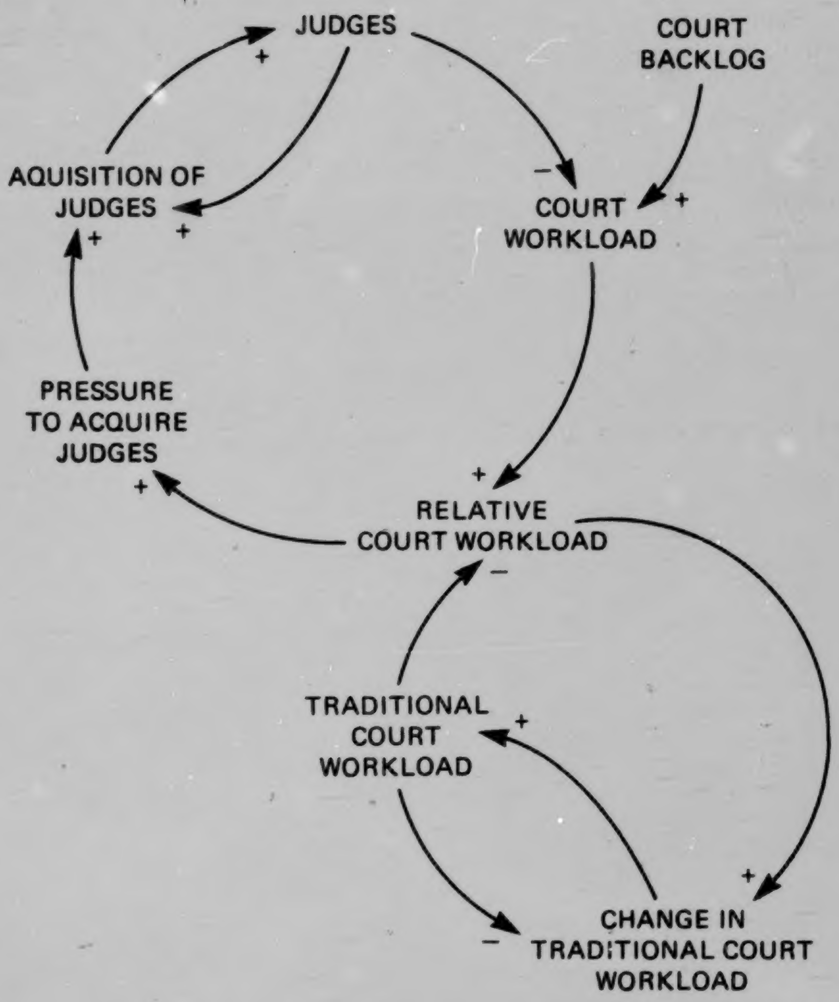
As shown in Figure 1.12, the feedback loops controlling the acquisition of judges are similar to those controlling the acquisition of police. As with police, judges are added in response to an increase in the actual workload relative to their traditional workload.

Equation CT-5 computes the number of judges. The initial number of judges is computed from State data for the initial year.

```
CT-5,L      JUDGE.K = JUDGE.J+(DT)(AJUDGE.JK)

CT-5.1,N    JUDGE =   IJUDGE
                      Judges (persons)
```

Figure 1.12

Feedback Loops Controlling the Acquisition of Judges


JUDGES
COURT BACKLOG
AQUISITION OF JUDGES
COURT WORKLOAD
PRESSURE TO ACQUIRE JUDGES
RELATIVE COURT WORKLOAD
TRADITIONAL COURT WORKLOAD
CHANGE IN TRADITIONAL COURT WORKLOAD
+
+
+
+
−
+
+
+
−
+
+
−

```
CT-5.2,C      IJUDGE =  390
                        Initial judges (persons)
```

Acquisition of judges (AJUDGE) is shown in Equation CT-6 as the product of the number of judges (JUDGE) and the pressure to acquire new judges (PAJUD).

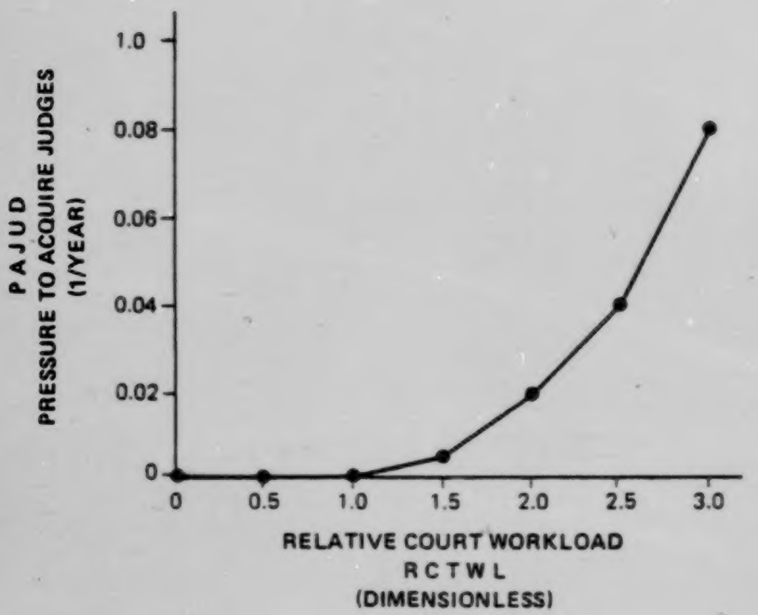
```
CT-6,R        AJUDGE.KL = (JUDGE.K)(PAJUD.K)
                           Acquisition of judges (persons/year)
```

The pressure to acquire judges PAJUD (Equation CT-7) is the fractional change in the annual number of judges. Figure 1.13 depicts the relation between the relative court workload (RCTWL) and the variable PAJUD. The relative court workload (RCTWL in Equation CT-8) is the ratio of the court workload (CTWL) to the traditional court workload (TCTWL).

```
CT-7,A        PAJUD.K = TABLE (TPAJUD,RCTWL.K,0,3,0.5)
                        Pressure to acquire judges (1/year)

CT-7.1,T      TPAJUD =  0.00/0.00/0.00/0.005/0.020/0.040/0.080
                        Table for pressure to acquire judges

CT-8,A        RCTWL.K = CTWL.K/TCTWL.K
                        Relative court workload (dimensionless)
```

Figure 1.13

The Pressure to Acquire Judges as a Function of the Relative Court Workload



As in the case of traditional police workload, the traditional court workload is a level. In this model it is determined by equation CT-9 which measures the variable TCTWL. The model assumes that TCTWL is influenced by two factors: the existing standards of a traditional court workload and changes that take place regarding the standards. The latter is seen as a flow measured by the variable CTCTWL determined in Equation CT-10 of the model. Equation CT-10 of the model shows that CTCTWL, or changes regarding what constitutes the traditional court workload, is in turn a function of the existing standards for the traditional court workload as measured by TCTWL, the relative workload variable (RCTWL), and the model parameter CTTAT which determines the period of adjustment between changes in perception and reality. The court tradition adjustment time is about half as long as the corresponding adjustment time for police, reflecting the assumption that the court tradition changes more rapidly and large backlogs of cases are more readily tolerated.

CT-9,L TCTWL.K = TCTWL.J+(DT)(CTCTWL.JK)

CT-9.1,N TCTWL = CTWL
Traditional court workload
(dimensionless)

CT-10,R CTCTWL.KL = (TCTWL.K)(RCTWL.K-1)/CTTAT
Change in traditional court workload
(1/year)

CT-10.1,C CTTAT = 6
Court tradition adjustment time (years)

Sentencing Sector

Introduction

The Sentencing Sector relates overloading in the courts and prisons to sentencing. The inputs to this sector are the court workload and prison crowding. This sector generates the maximum and minimum court-imposed sentences and the fraction of cases resulting in imprisonment.

Two control mechanisms are primarily at work in this sector. First, as the court workload increases, pressures mount to reduce the court-imposed sentence and the fraction of cases resulting in imprisonment, through plea bargaining. As judges and prosecutors reduce the severity of sentences, defendants are encouraged to plead guilty, thus speeding the flow of cases through the courts. A second control mechanism relates prison crowding to the fraction of cases resulting in imprisonment. Some judges are reluctant to sentence offenders to overcrowded facilities, and a tendency may exist to reduce the fraction of cases resulting in imprisonment and to reduce the length of the court-imposed sentence, thereby reducing the flow of offenders to prisons and prison overcrowding.

Minimum and Maximum Court-imposed Sentences

The minimum court-imposed sentence (MNCIS) is determined by the product of the reference minimum court-imposed sentence (RMNCIS), the impacts of workload (IWNS), and perceived prison crowding (ICCIS).

```
ST-1, A MNCIS.K = (RMNCIS)(IWNS.K)(ICCIS.K)
                  Minimum court-imposed sentence (years)

ST-1.1,C RMNCIS = 1
                  Reference minimum court-imposed sentence (years)

ST-1.2,A    IWNS.K=STABLE(TIWNS1,TIWNS2,CTWL.K,0,2,0.2)
                   Impact of workload on minimum court-imposed
                   sentence (dimensionless)

ST-1.3,T    TIWNS1=1/1/1/1/1/1/1/1/1/1/1
                   First table for impact of workload on court-
                   imposed sentence

ST-1.4,T    TIWNS2=1/1/1/1/1/1/1/1/1/1/1
                   Second table for impact of workload on court-
                   imposed sentence

ST-1.5,A    ICCIS.K=TABLE(TICCIS,CRWCT.K,0,2,0.2)
                   Impact of crowding on court-imposed sentence
                   (dimensionless)

ST-1.6,T    TICCIS=1/1/1/1/1/1/1/1/1/1/1
                   Table for impact of crowding on court-imposed
                   sentence

ST-1.7,L    CRWCT.K=CRWCT.J+(DT/CRPCT)(CRW.J-CRWCT.J)

ST-1.8,N    CRWCT=CRW
                   Prison crowding perceived by the courts
                   (dimensionless)

ST-1.9,C    CRPCT=4
                   Crowding perception time for courts
                   (years)
```

The maximum court-imposed sentence is determined in an exactly analogous fashion.

ST-2, A MXCIS.K = (RMXCIS)(IWXS.K)(ICCIS.K)
Maximum court-imposed sentence

ST-2.2, C RMXCIS = 10
Reference maximum court-imposed sentence (years)

ST-2.2,A IWXS.K=STABLE(TIWXS1,TIWXS2,CTWL.K,0,2,0.2)
Impact of workload on maximum court-imposed sentence (dimensionless)

ST-2.3,T TIWXS1=1/1/1/1/1/1/1/1/1/1/1
First table for impact of workload on maximum court-imposed sentence

ST-2.4,T TIWXS2=1/1/1/1/1/1/1/1/1/1/1
Second table for impact of workload on maximum court-imposed sentence

Since California, which has indeterminate sentencing, is being used to calibrate the model, neither workload nor crowding are assumed to affect the minimum sentence. With indeterminate sentencing, the minimums presumably are much lower than the time typically served, so that changing the minimums does not have much impact in the plea bargaining process. However, the ability to influence court-imposed sentences is retained in the model for States with more determinate forms of sentencing than California.

Fraction of Cases Resulting In Imprisonment

The fraction of cases resulting in imprisonment (FCRI in Equation ST-4) is the fraction of cases adjudged that result in the defendant being imprisoned. FCRI is computed as the product of three factors: the reference fraction of cases resulting in imprisonment (RFCRI), the impact of workload on fraction imprisoned (ICFI). RFCRI is the fraction of cases resulting in imprisonment for the base year.

ST-4,A FCRI.K=(RFCRI)(IWFI.K)(ICFI.K)
Fraction of cases resulting in imprisonment

ST-4.1,C RFCRI=.1
Reference fraction of cases resulting in imprisonment (dimensionless)

Figure 1.14 depicts the relation between the court workload and the impact of workload on the fraction imprisoned (IWFI in Equation ST-5). This relation reflects the assumption that as the court workload increases, a larger fraction of cases are dismissed and a larger fraction of convictions do not produce prison sentences due to plea negotiations.

```
ST-5,A   IWFI.K= TABLE(TIWFI,CTWL.K,0,2,0.2)
                    Impact of workload on fraction imprisoned
                    (dimensionless)

ST-5.1,T            TIWFI=3/2.4/1.8/1.4/1.1/1.0/.9/.8/.75/.7/.67
                    Table for impact of workload on fraction
                    imprisoned
```

Figure 1.14

The Impact of Workload on Fraction Imprisoned as a Function of the Court Workload

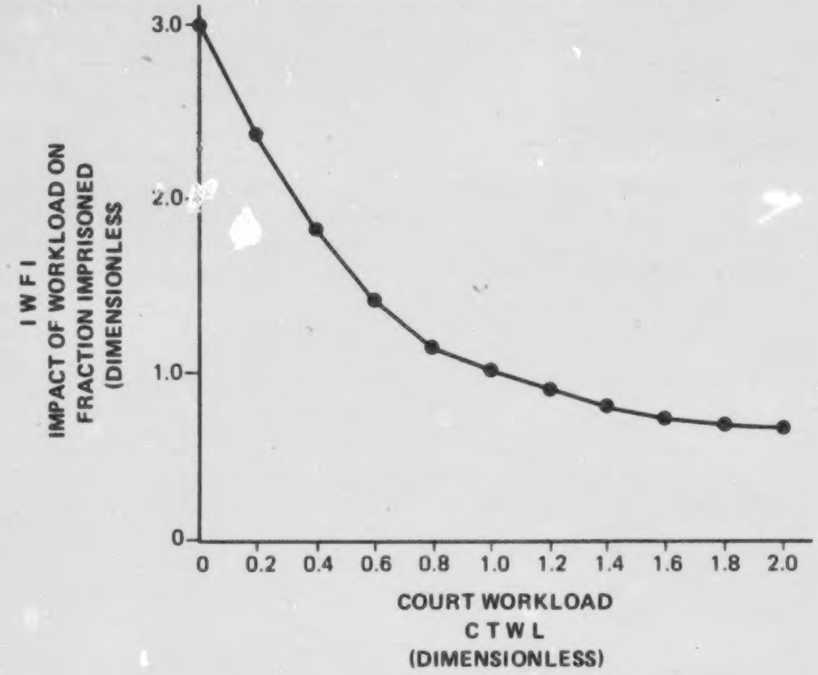
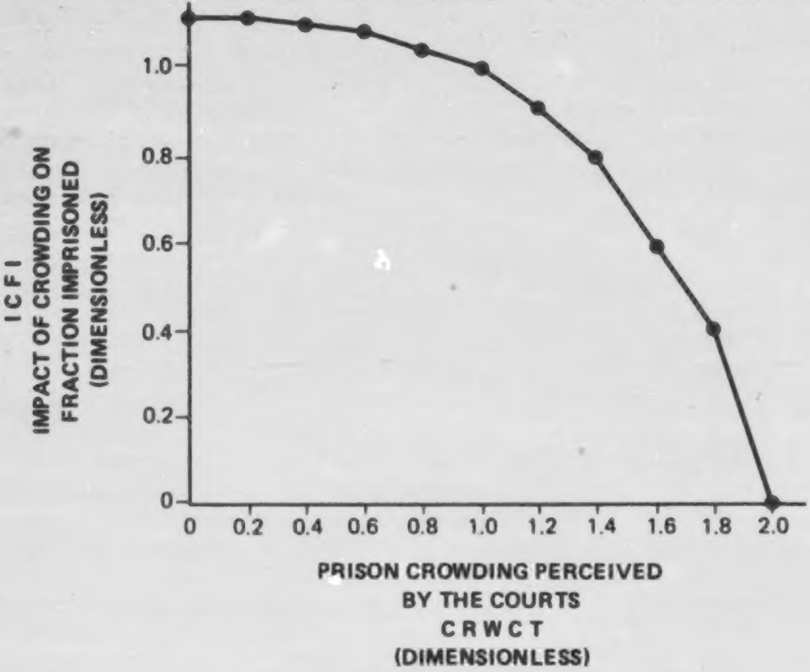


Figure 1.15 depicts the relation between the perceived prison crowding and the impact of crowding on the fraction imprisoned. This relation reflects the assumption that as crowding increases, judges sentence a smaller percentage of offenders to prison.

```
ST-6,A ICFI.K=TABLE(TICFI,PCRW.K,0,2,0.2)
                        Impact of crowding on fraction imprisoned
                        (dimensionless)

ST-6.1,T                TICFI=1.1/1.1/1.08/1.06/1.03/1.0/.92/.8/.6/.4/0
                        Table for the impact of crowding on fraction
                        imprisoned (dimensionless)
```

Figure 1.15

The Impact of Crowding on Fraction Imprisoned as a Function of Prison Crowding Perceived by the Courts



Corrections Sector

Introduction

Prison authorities have strong incentives to keep the prison population at approximately the prison capacity. Overcrowding can downgrade security and create unrest among prisoners. It also leads to budgetary problems. An unforeseen rise in the prison population increases costs above those planned for in the budget.

The Corrections Sector represents the assumptions about the regulation of the prison population. Figure 1.16 depicts the feedback loops controlling prison population. If the prison population rises above capacity, administrators are assumed to encourage the early paroling of prisoners, thus causing the average effective sentence to drop and the prisoners released to increase. These actions tend to bring prison population back in line with capacity. The ability of correctional officials to influence parole politics varies from State to State and should be kept in mind throughout this section.

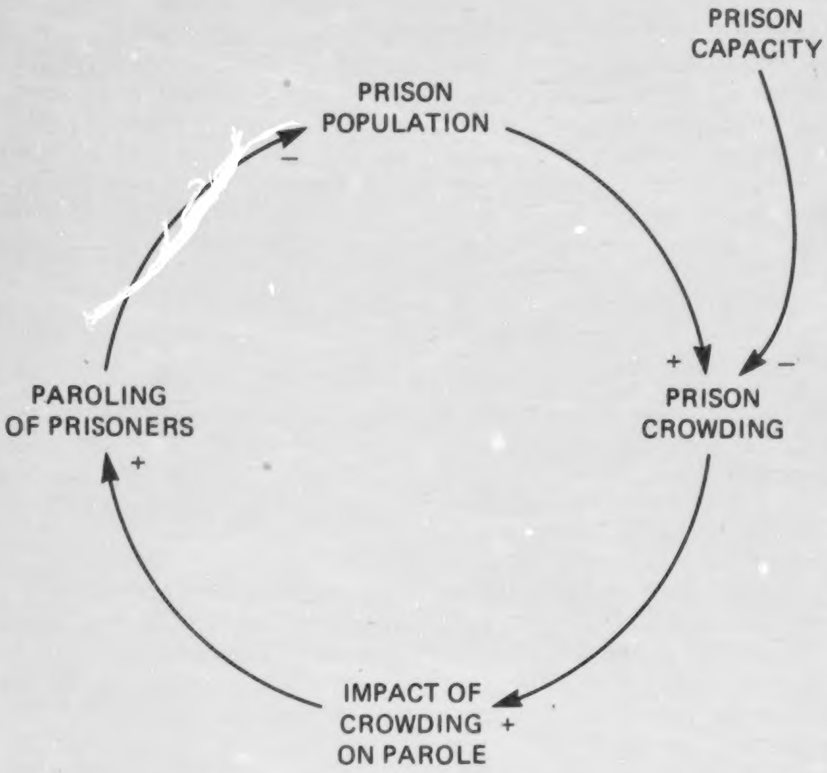
Offenders Imprisoned

The model utilizes three categories of persons: prisoners, new offenders, and former prisoners. Prisoners are, of course, those incarcerated in penal institutions. Former prisoners are those who have been released from prison within the last five years. New offenders are offenders who have never been in prison before. The variable NOI measures those active new offenders who are sent to prison. That is, NOI represents the flow of new commitments to the court (as measured by the variable NWCOM) who are not former prisoners and who are not placed in community correctional facilities.

```
CR-1, R      NOI.KL=(NWCOM.K)(1-FFPI.K)(1-FNCC.K)
      Note          New offenders imprisoned (persons/year)
                    (NCC.K)
```

Figure 1.16

Casual Loop Diagram of Feedback Between Parole and Prison Population


PRISON CAPACITY
PRISON POPULATION
–
+
–
PRISON CROWDING
PAROLING OF PRISONERS
+
IMPACT OF CROWDING ON PAROLE
+

Equation CR-2 introduces the variable FMPRI which measures the total number of those committed to prisons who were imprisoned in the past. FMPRI is determined by two factors: the portion of new commitments by the court who are former prisoners and those former prisoners who are returning to prison because of parole violation. The latter is measured in equation CR-2 by the variable RETPR which is discussed in later sections.

```
CR-2, R   FMPRI.KL=(NWCOM.K)(FFPI.K)+RETPR.K
                    Former prisoners imprisoned (person/year)
```

In equation CR-3, the new variable, commitments from the courts (NWCOM), is calculated as the product of the total number of court cases adjudged (CTADJ), the fraction of these cases that result in imprisonment (FCRI), and the number of defendants per case (DPC--a model parameter). Total offenders is then measured in equation CR4 as the sum of new offenders imprisoned and former prisoners reimprisoned.

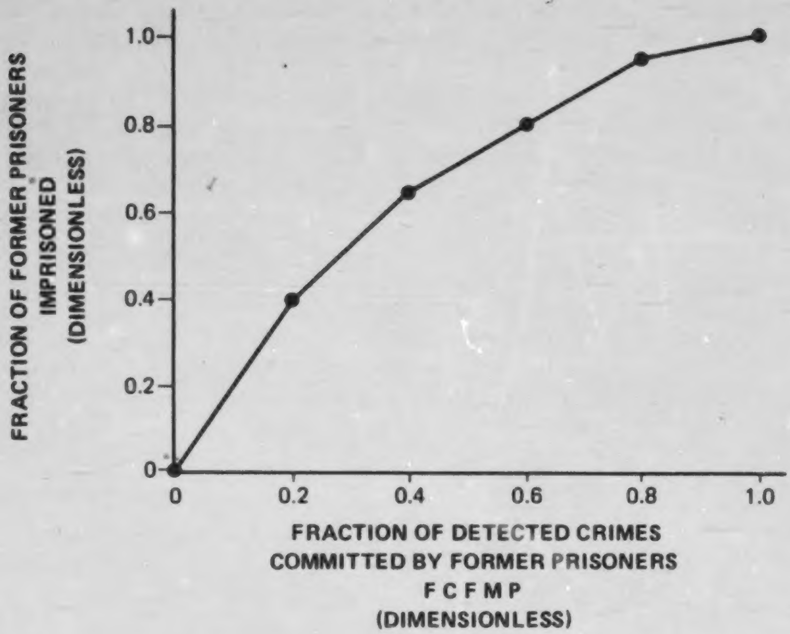
```
CR-3, A    NWCOM.K=(CTADJ.K)(DPC)(FCRI.K)
                    New commitments from court (persons/year)

CR-3.1,C   DPC=0.95
               Defendants per case (cases/year)

CR-4, A    OI.K=NOI.JK+FMPRI.JK
                Total offenders imprisoned (persons/year)
```

The fraction of former prisoners imprisoned (FFPI) depends on the fraction of detected crimes committed by former prisoners (FCFMP). The shape of the hypothesized relationship is presented in Figure 1.17. The larger the proportion of detected crimes committed by former offenders, the larger will be the fraction of former prisoners imprisoned.

The model then calculates the variable FCFMP in equation CR-5. In order to calculate this variable, which measures the fraction of detected crimes committed by former prisoners, the total volume of crimes committed by former prisoners must be determined. This volume is calculated as the product of former prisoners (FMPR) and the propensity of former prisoners to commit crime (PCFMPR), plus the addition of cases referred to court instead of being handled through parole (ACFRP). FCFMP is simply this total volume divided by the number of detected crimes.

Figure 1.17

The Fraction of Former Prisoners Imprisoned
as a Function of the Fraction of Detected Crimes Committed by Former Prisoners



```
CR-5, A    FCFMP.K=[(FMPR.K*PCFMPR)+ACFRP.K]/CRIME.K
                     Fraction of detected crimes committed by
                     former prisoners (dimensionless)
```

The propensity for crime by former prisoners PCFMPR is initialized as the product of crime in the initial year ICRIME, and the initial fraction of crimes committed by former prisoners IFCFMP divided by the volume of former prisoners FMPR. IFCFMP is estimated roughly from data on the fraction of offenders imprisoned who have prior prison records.

```
CR-6, N    PCFMPR=(ICRIME)(IFCFMP)/FMPR
                   Propensity for crime by former prisoners (cases/
                   person-year)

CR-6.1,C   IFCFMP = 0.17
           Initial fraction of crimes committed by former prisoners

CR-6.2,N   ICRIME = TABLE(TCRIME,1TIME,1955,1995,5)
           Initial crime (cases/year)
```

Prisoners

Equations CR-7 through CR-7.2 seek to determine the total prison population--a level. This level is measured by the variable PRSN. PRSN is a function of four key variables: initial prison population, new offenders imprisoned, former prisoners imprisoned, and prisoners who have been released. The initial prison population is a parameter (IPRSN) of the model assumed to be equal in these runs to 14,400 persons. New offenders imprisoned (NOI) and former prisoners imprisoned (FMPRI) are seen to feed the level of prisoners (PRSN) incarcerated (equation CR-7) while prisoners released (PRRL) depletes this level.

CR-7, L   PRSN.K=PRSN.J+(DT) (NOI.JK+FMPRI.JK-PRRL.JK)

CR-7.1,N   PRSN-IPRSN
Prisoners (persons)

CR-7.2,C   IPRSN=14400
Initial prisoners (persons)

The variable PRPL in equations CR-7 and CR-8 measures the numbers of prisoners released. It is itself determined in equation CR-8 and equals the total number of prisoners in a given year divided by the average effective sentence (AES).

CR-8, R   PRRL.KL=PRSN.K/AES.K
Prisoners released (persons/year)

The average effective sentence (AES) is the average sentence actually served by offenders. The formulation (equations CR-9 and CR-10) asserts that AES will equal the indicated average effective sentence (IAES) if the variable IAES falls between the average minimum court-imposed sentence (AMNCIS) and the average maximum court-imposed sentence (AMXCIS). If IAES falls below the minimum or above the maximum court-imposed sentence, AES is set equal to these values, respectively.

CR-9, A   AES.K (SWF.K)('AMNCIS.K)+(1-SWF.K)(AMXCIS.K)
Average effective sentence (years)

CR-10, A   SWF.K=TABLE (TSWF, IAES.K, AMNCIS.K, AMXCIS.K,
AMXCIS.K-AMNCIS.K)

Sentence weighting factor (dimensionless)

CR-10.1,T TSWF-1/0
Table for sentence weighting factor

The average minimum and maximum court-imposed sentences are calculated using an identical structure. The structure is used in both calculations and has been generalized into a subroutine which is referred to as MACRO. Inputs to the MACRO are current court-imposed sentence (CIS), offenders imprisoned (OI), prisoners released (PRRL), and the total prison population (PRSN). The output from the MACRO is the current average court-imposed sentence. The MACRO calculates a total sentence time ($TST) as the difference between the sentence time of prisoners currently being sentenced ($STIN) and the length of sentence served by those prisoners being released ($STOUT).

```
MACRO AVSNT (CIS, OI, PRRL, PRSN)
          CIS court-imposed sentence (years)
           OI offenders imprisoned (persons/year)
         PRRL prisoners released (persons/year)
         PRSN prisoners

A AVSNT.K=$TST.K/PRSN.K
          Average sentence (years)

L $TST.K=$TST.J+(DT)($STIN.JK-$STOUT.JK)

N TST=(PRSN)(CIS)
          Total sentence time (person-years)

R $STOUT.KL-(PRRL.K)(AVSNT.K)
          Sentence time out (person-years/year)

MEND
```

In equation CR-11, indicated average effective sentence (IAES) is calculated as the traditional average effective sentence (TAES) moderated by the effect of prison crowding on sentence length (ECS).

```
CR-11,A   IAES.K=(TAES.K)(ECS.K)
```

The variable TAES reflects the tradition developed around sentence lengths in individual States. TAES is formulated as an exponentially weighted average of past sentence lengths. The parameter that measures averaging time TSAT is set at two years.

```
CR-12,L   TAES.K=TAES.J+(DT/TSAT)(AES.J-TAES.J)+PULSE(CAES*AES.K,PCY,1000)

CR-12,1,C TSAT=2
                TAES  Traditional average effective sentence (years)

                TSAT  Tradtional sentence adjustment
                      Time (years)
```

Crowding, as perceived by the parole authority (CRWPR), influences sentence length. The nature of the assumed relationship is depicted in Figure 1.18. As the parole authority perceives increased prison corwding, it feels pressure to reduce in turn sentences served. As perceived crowding falls below reference levels, parole authorities are more likely to place upward pressure on sentence lengths.

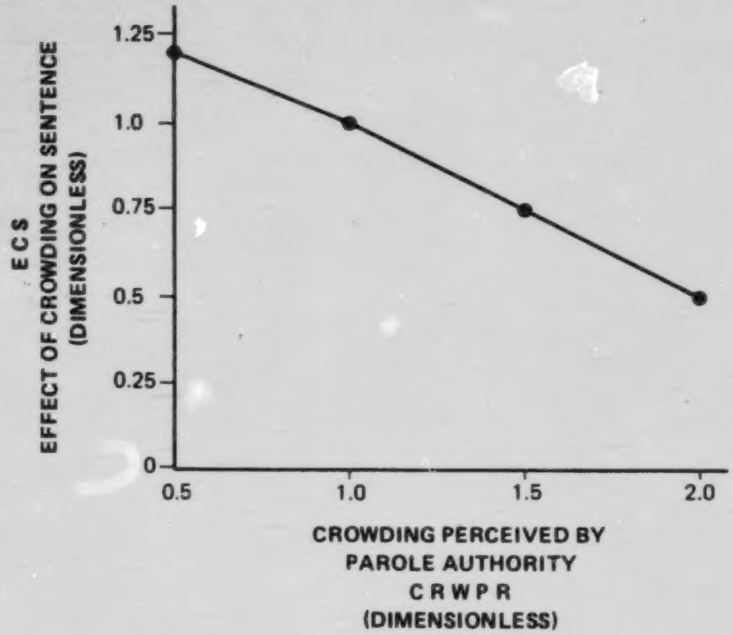


Figure 1.18

The Effect of Crowding on Sentence as a Function of the Crowding Perceived by Parole Authority

In equation 13, crowding as perceived by the parole authority (CRWPR) is a lagged response to actual prison crowding (CRW). The variable CRPPR represents the time it takes parole authorities to become fully aware of the true state of prison crowding.

```
CR-13,L    CRWPR.K=CRWPR.J+(DT/CRPPR)(CRW.J-CRWPR.J)
                   Crowding perceived by parole authority
                   (dimensionless)

CR-13.1,C CRPPR=1
                   Crowding perception time for parole authority (years)
```

Actual prison crowding CRW in equation CR-14 is defined as the ratio of prisoners (PRSN) to prison capacity (PRCAP).

```
CR-14,A   CRW.K=PRSN.K/PRCAP.K
                  Prison crowding (dimensionless)
```

Returns from Parole

The variable RETPR (returns from parole) in equation CR-15 measures the flow of parole violators back into the prison system. RETPR is calculated as the product of the reference fraction returned from parole (RFRP), the former prisoner population (FMPR) and a policy variable that allows for a reduction in parole at a specified point in time (PARSW). RFRP is initialized using State data for the base year.

```
CR-15,A   RETPR.K=(RFRP) (FMPR.K) (PARSW.K)
                  Returns from parole (persons/year)

CR-15.1,N RFRP=IRETPR/FMPR
                  Reference fraction returned from parole (1/year)

CR-15.2,C IRETPR=1125
                  Initial returns from parole (persons/year)

CR-16,A   PARSW.K=1-STEP(DCPR,PCY)
                  Parole switch (policy variable)

CR-16.1,C DCPR=0
                  Decrease in parole (dimensionless)
```

The variable FMPR, in equations CR-17 and CR-17.1, is a measure of the number of former prisoners--a level. As such, it is increased by the number of prisoners released (PRRL) and reduced by the number of former prisoners reimprisoned (FMPRI) and by the aging of former prisoners (AGFMPR).

```
CR-17,L   FMPR.K=FMPR.J+(DT)(PRRL.JK-FMPRI.JK-AGFMPR.JK)

CR-17.1,N FMPR=(NOI)(ATFMPR)
                  Former prisoners (persons)

CR-17.2,C ATFMPR=5
                  Average time as former prisoner (years)
```

The variables affecting FMPR, PRRL, and FMPRI have both been discussed in earlier sections. The variable AGFMPR which represents the aging of former prisoners in equation CR-17 is itself determined in equation CR-18. AGFMPR is formulated as the level of former prisoners (FMPR) divided by an average length of time with former prisoners remaining in this category (ATFMPR). ATFMPR is established using State data for the base year.

CR-18,R AGFMPR.KL=FMPR.K/ATFMPR
Aging out of former prisoners (person/years)

Additional cases referred to the court system instead of being handled through the parole system (ACFRP) are calculated as the product of former prisoners (FMPR), the reference fraction returned from parole (RFRP), and the fraction of parole revocations that are suitable for court cases (FRSCC). This product is then converted from persons to cases by dividing through by defendants per case (DPC). In addition, a policy switch is included for investigating alternative parole policies (PARSW). In the current formulation, PARSW is set equal to 1.0. This results in ACFRP becoming equal to zero.

CR-19,A ACFRP.K=[(RFRP)(FMPR.K)(FRSCC)/(DPC)](1-PARSW.K)
Additional cases referred to court instead of handled through parole (cases/year)

CR-19.1,C FRSCC=0.8
Fraction of revocations suitable for court cases (dimensionless)

Community Corrections Programs

Community corrections programs represent an alternative to imprisonment for new offenders. The variable NOPCC, the number of new offenders placed in community correctional programs, is determined in equation CR-20 by multiplying the volume of new commitments from the courts (NWCOM) by the fraction of new commitments who are new offenders (1-FFP1.K), and by the fraction of new offenders placed in community corrections programs (FNCC).

CR-20,R NOPCC.KL=(NWCOM.K)(1-FFPI.K)(FNCC.K)
New offenders placed in community corrections programs (persons/year)

If the community corrections program is functioning, the variable FNCC in equation CR-21 will be a function of the degree of crowding existing in the community corrections facilities, as measured by the variable CCCRW. In our base run, however, no community corrections program is assumed to be operative, and hence, FNCC takes on the value of zero regardless of the value that CCCRW takes.

CR-21,A FNCC.K=STABLE (TFNCC1,TFNCC2,CCCRW.K,0.5,1.5,0.5)
Fraction of new offenders placed in community corrections program (dimensionless)

CR-21.1,T TFNCC1=0/0/0
First table for fraction of new offenders placed in community corrections program

CR-21.2,T TFNCC2=0/0/0
Second table for fraction of new offenders placed in community corrections program

In subsequent scenario analysis, the impact of the corrections program is activated by allowing FNCC to vary (i.e., assume non-zero values) as a function of CCCRW.

CCCRW is calculated in equation CR-22 by dividing the volume of participants in community corrections programs (PCCP) by the capacity available in the programs (CCPCAP).

CR-22,A CCCRW.K=PCCP.K/CCPCAP
Community corrections program crowding (dimensionless)

CR-22.1,C CCPCAP=10000
Community corrections program capacity (persons)

PCCP is a level that is increased by new offenders placed in community corrections programs (NOPCC) and decreased by the number of persons released from these programs (RLCC). Since the programs are not activated in the base run, initial community corrections program population is set to zero.

CR-23,L PCCP.K=PCCP.J+(DT)(NOPCC.JK-RLCC.JK)
CR-23.1,N PCCP=0
Participants in community corrections programs (persons)

Participants are released from community corrections programs (RLCC) after spending an average sentence length measured by the parameter (ASCCP).

CR-24,R RLCC.KL=PCCP.K/ASCCP
Releases from community corrections programs (persons/year)

CR-24.1,C ASCCP=2
Average sentence in community corrections program (years)

Prison Capacity Sector

Overview

The Prison Capacity Sector discusses the assumptions and variables contributing to the construction of prison facilities. The sector distinguishes between current facilities and obsolete facilities. Obsolete facilities are those that are sufficiently old to be candidates for closing if the demand for space permitted. New facilities are assumed to be constructed in response to current prison overcrowding, projections of future prison population, and obsolete facilities in need of replacement.

Facilities

Total prison capacity (PRCAP) in equation PC-1 is made up of the sum of current facilities (FAC) and of obsolete facilities (OBFAC).

PC-1,A PRCAP.K=FAC.K+OBFAC.K
Prison capacity (persons)

The variable OBFAC in equation PC-2 measures the level of obsolete facilities. By definition, obsolete facilities are those facilities considered to be too decrepit for optimal use as prisons--though in actuality may still be in use. As such, OBFAC is considered to be influenced by two factors: the existing level of obsolete facilities and the net increase (or net decrease) in existing obsolete facilities. The latter is determined by the rate of facility obsolescence (FACOB) minus the obsolete facilities that are closed (FACCL). The initial value for the existing level of obsolete facilities is set based on State data.

PC-2,L OBFAC.K=OBFAC.J+(DT)(FACOB.JK-FACCL.JK)

PC-2.1.N OBFAC=IOBFAC
Obsolete facilities (persons)

PC-2.2,C IOBFAC=4600
Initial obsolete facilities (persons)

Facility obsolescence (FACOB) in equation PC-3 is defined as the stock of current facilities (FAC) divided by the average lifetime of facilities (ALF).

PC-3,R FACOB.KL=FAC.K/ALF.K
Facility obsolescence (persons/year)

ALF is considered to be a policy variable. It is formulated to allow the initial average lifetime of facilities (IALF) to be reduced to a new value RALF after a specified policy change year (PCY).

PC-4,A ALF.K=CLIP(IAFL,RALF,TIME.K,PCY)
ALF average lifetime of facilities (years)

PC-4.1,C IALF=75
IALF initial average lifetime of facilities (years)

Equation PC-5 determines the variable FAC which measures the stock of current facilities. This level is increased by any newly constructed facilities undertaken by the State (FACN) and by any new facilities constructed under a Federal program (FDFCP). FAC is diminished by facility obsolescence (FACOB) and by the reduction in capacity that results from more stringent standards (RCSS). The initial value of FAC is based on State data.

PC-5,L FAC.K=FAC.J+(DT)(FACN.JK-FACOB.JK+FDFCP.JK-RCSS.JK)

PC-5.1,N FAC=IFAC
Facilities (persons)

PC-5.2,C IFAC=9800
Initial facilities (persons)

Construction of Facilities

Facilities in planning (FACPL) is a level reflecting facilities currently being planned or considered. The level is increased by new plans for facilities (NPLFAC) and decreased by those facilities already under construction (FACN) or by plans cancelled (CANPL). The initial value of FACPL is calibrated as the discrepancy between indicated prison capacity (IPRCAP) and prison capacity (PRCAP), if this discrepancy is positive. If PRCAP exceeds IPRCAP, FACPL is set at zero.

PC-6,L FACPL.K=FACPL.J+(DT)(NPLFAC.JK-FACN.JK-CANPL.JK)

PC-6.1,N FACPL=MAX(0,IPRCAP-PRCAP)
Facilities in planning (persons)

Total facility construction (FACN) is calculated in equation PC-7 as the product of facilities in planning (FACPL) and the fraction of plans that are not cancelled (1-FPCNC) divided by the facility planning delay (FPLDY). The parameter FPLDY indicating the average delay between facility planning and construction has been set at five years.

PC-7,R FACN.KL=(FACPL.K)(1-FPCNK)
Facility construction (persons/year)

PC-7.1,C FPLDY=5
Facility planning delay (years)

Cancellation of plans (CANPL in equation PC-8) is determined by multiplying facilities in planning (FACPL) by the fraction of plans that are cancelled (FPCNC) and dividing the result by the facility-planning delay (FPLDY).

PC-8,R CANPL.KL=(FACPL.K)(FPCNC.K)/FPLDY
Cancellation of plans (persons/year)

The fraction of plans cancelled (FPCNC) depends upon crowding as perceived by parole authorities (CRWPR). The nature of the hypothesized relationship is depicted in Figure 1.19. As suggested by the figure, when perceived crowding increases, the fraction of plans cancelled declines, and vice versa.

Indicated Prison Capacity

The indicated prison capacity (IPRCAP) in equation PC-9 is a projection of capacity used for planning new facilities. Indicated prison capacity is a weighted average of the current prisoners (PRSN) and the projected prison population (PPRPOP). The weighting factor (PJW) represents the relative weight applied to current conditions and to the projection of future conditions in planning facilities.

PC-9,A IPRCAP.K=(PJW)(PPRPOP.K)+(1-PJW)(PRSN.K)
Indicated prison capacity (persons)

PC-9.1,C PJW=1
Projection weighting factor (dimensionless)

Projected prison population (PPRPOO) in equation PC-10 is an extrapolation of the indicated prison population (IPRPOP). The extrapolation is performed by the TREND function.

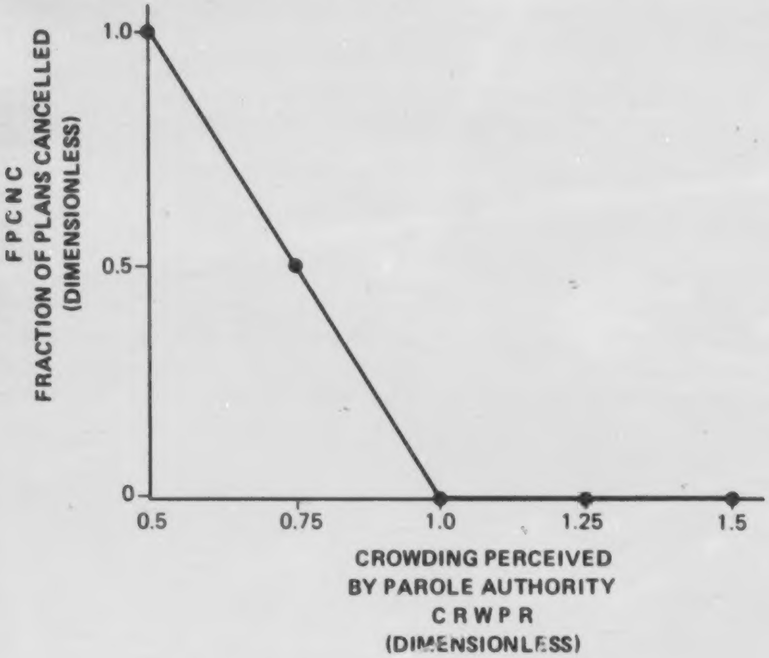
PC-10,A PPRPOP.K=TREND(IPRPOP.K,AVTM,ICCP)
Projected prison population (persons)

PC-10.1,C PJTM=5
Projection time (years)

PC-10.2,C AVTM=5
Averaging time (years)

Figure 1.19

The Fraction of Plans Cancelled
as a Function of the Crowding Perceived by Parole Authority



PC-10.3,C ICCP=0
Initial change in current capacity needed (persons/years)

The indicated prison population (IPRPOP) in equation PC-11 is the prison population that would exist if the current rate of offenders imprisoned were to serve the traditional length of their court-imposed sentences.

PC-11,A IPRPOP.K=OI.K)(TAES.K)
Indicated prison population (persons)

Closing Facilities

Facilities closed (FACCL) is calculated as the product of obsolete facilities (OBFAC) and the variable that measures the effect of prison crowding on closings (EPCL) divided by the average time facilities last as obsolete (ATOF). ATOF is assumed to be 25 years.

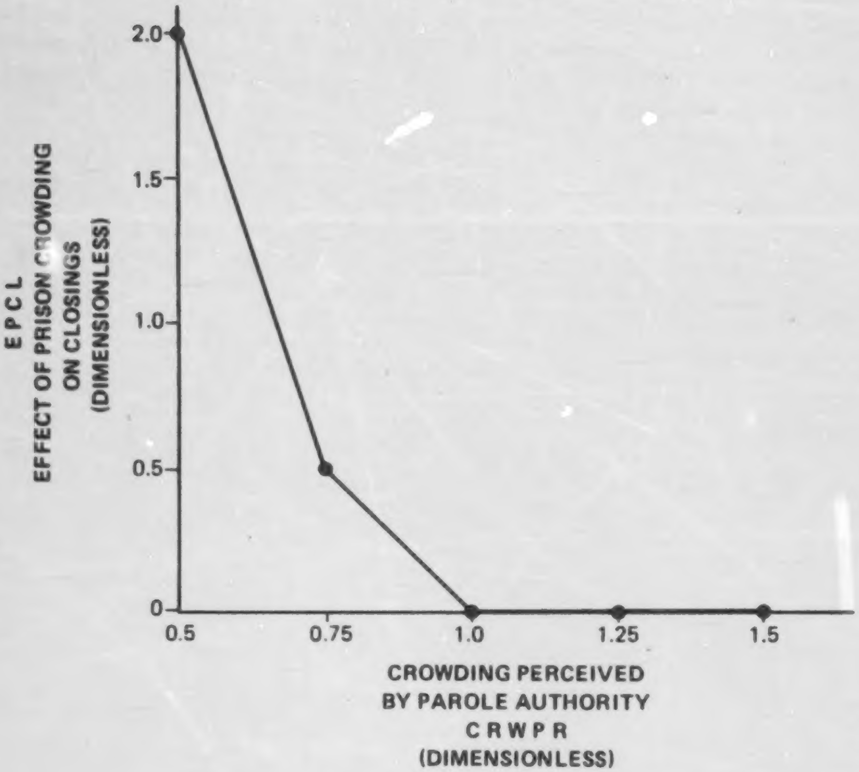
PC-12,R FACCL.KL=(CBFAC.K)(EPCL.K)/ATOF
Facilities closed (persons/year)

PC-12.1,C ATOF=25
Average time as obsolete facilities

The effect of prison crowding on closings (EPCL) is depicted in Figure 1.20. As crowding, perceived by parole authorities (CRWPR) increases, prison officials feel considerable pressure to keep obsolete or marginal facilities in operation for longer periods. Hence, the closing of these facilities declines sharply with increased crowding.

Figure 1.20

The Effect of Prison Crowding on Closings as a Function of the Crowding Perceived by Parole Authority



Court-Mandated Changes in Facilities and Federal Construction Program

Reduction in capacity, as a result of the more stringent standards (RCSS), reflects the possibility of implementing various court-mandated measures on an existing prison system. Examples of such measures might be a reduction in the allowable number of prisoners per cell or an ordered increase in the amount of cell space per prisoner. RCSS is modeled as a policy variable that is inoperative initial calibration, as a result of setting the fraction of reduction in capacity from the imposition of stiffer standards (FRCSS) equal to zero.

```
PC-13,A        RCSS.K=PULSE[(FAC.K*FRCSS/DT),PCY,1000]
                         Reduction in capacity from the imposition
                         of stiffer standards (persons/year)
```

PC-13.1,C FRCSS=0
Fraction of reduction in capacity from imposition of stiffer standards (dimensionless)

Finally, an additional policy variable representing the possibility of a Federal prison-construction program is included. Federal facility-construction program (FDFCP) is represented as a delay of facilities constructed under Federal programs (FCFDP). The delay (DCFFD) represents the time that it takes to bring new facilities on line. In the initial calibration FCFDP is set to equal to zero.

PC-14,A FDFCP.K=DELAY3[PULSE(FCFDP/DT,PCY,10000),DCFFD]
Federal facility-construction program (persons/years)

PC-14.1,C FCFDP=0
Facilities constructed under federal programs (persons)

PC-14.2,C DCFFD=3
Delay in constructing facilities under federal programs (years)

I. NOTES

1. Lucius Riccio, "Apprehension Productivity of Police in Large U.S. Cities," forthcoming in The Journal of Criminal Justice.

2. Selwyn Raab, "Plea-bargains Settling 8 of 10 Homicide Cases," The New York Times, January 21, 1975, p. 1.

II. VALIDATION OF THE CORRECTIONAL PLANNING MODEL

To validate the Correctional Planning Model, its output is compared with data from the jurisdiction to which it was applied. These jurisdictions included the states of California, Illinois, Iowa, Massachusetts, and South Carolina, and the Federal criminal justice system.

This comparison is accomplished for California, Illinois, Iowa, and the Federal System by presenting three sets of graphs for each jurisdiction. Actual jurisdictional data are presented in the graphs on the top half of each of the sets, while the bottom half of each page contains the graphs which delineate the output of the model for the corresponding variable.

For the following periods, the data depicts variables in the courts and correctional areas:

California	1955 - 1973
Illinois	1961 - 1975
Iowa	1956 - 1975
Federal	1960 - 1975

However, some series are incomplete, due to data inavailability.

The purpose of the first set of graphs is to show the relationship between increases in crime and sentenced offenders. Represented in the first graph are relative changes from initial values of crimes (FBI index), court cases filed in the major trial courts (e.g., Superior Court), and court commitments to prison. Since variables are displayed as a ratio to their initial values, the normal point is one, with a range from 0 to less than 10. The second set of graphs depicts court cases filed or disposed, court backlog, and the fraction of cases resulting in the defendant's imprisonment. These numbers are absolute, rather than in ratio form. Indicated in the third set are prisoners, court commitments to prison, total admissions (court commitments plus parole revocations), prisoners released, and average effective sentence (average time served). Scales for the first and third graphs in each set are identical for a given variable. By visual inspection, the reader can compare the model's behavior with the actual data. For more detailed comparison, tabulated charts for prison population are provided in addition to the graphs.

Data inconsistencies for Massachusetts necessitated omission of the first set of graphs. Since the court data is solely based on crimes against persons and property, a large number of drunkenness cases, which distort the dynamics of processing serious criminal cases, have been omitted. The correctional data was obtained from the National Prisoner Statistics. Since data from these two sources did not overlap for several years, selection of a meaningful initial point to compute the ratios was difficult. Data is present from 1955 to 1975 with gaps in several series.

Court data for South Carolina did not permit operation of the model before 1974. Thus, a sufficiently long time series could not be established for meaningful comparison. Only the prisoner tabulations for 1974 through 1975 are presented for South Carolina.

To produce the graphs and tabular output for the necessary validation, the model is run with exogenously specified values of the crime variable. The reader should expect the graphs of the crime variable to match the data (with some slight deviation due to using in the model values of crime selected at five year intervals and linear interpolation for intermediate years.) Matching this variable with the data is not represented as a validation of the model.

The model is initialized with data (prisoners, court backlog) from the jurisdiction, and allowed to operate under its own control with the values of crime being the exogenous input. The results are plotted or tabulated.

Limitations of Data Comparisons as a Validation Approach

Dynamic models should be evaluated at two levels:

- The model structure, including the model's scope relative to the problem under study, the interaction of variables, and the values of parameters

- The behavior of the whole model

Evaluating the model structure requires corresponding of one's understanding of the causal links in the system to the individual assumptions in the model. This requirement does not rule out simplification, but the assumptions should match the important causal relations in the actual system.

Validation of the model structure has occured through development of model assumptions based on discussions with correctional officials and criminal justice researchers. Also, relevant literature has been consulted. Of course, experts do not agree necessarily on many of the assumptions used. Thus, evaluation of the model structure is incomplete. An individual using the model may want to change assumptions. The model aids in this process by permitting flexibility in changing parameters and structure.

The second level of model evaluation is judging the behavior of the whole model. The output from the simulations should resemble behavior observed in the real system. In particular, the model should generate the symptoms of the problems under study. This evaluation is called whole model testing. Problems exist with this method of evaluation. First, a dynamic model is unlikely to produce identical behavior of the system, although showing the general characteristics. Dynamic behavior arises from three sources, structure of the system, external inputs, and initial values. A model is expected to produce the important symptoms within its dynamic structure without the influence of extensive external inputs. Since complex external influences have some effect on system variables, the model cannot reproduce past values precisely. Second, by adjusting parameters, the modeler can improve the fit between data and model output without improving the validity of the model. A large discrepancy between the data and the model output may indicate a factor overlooked or a faulty structure in the model; but small discrepancies may simply indicate the presence of minor external factors or noise in the system. Thus, "fine tuning" the model to closely fit the data does not really improve confidence in the model, since a dynamic model has a number of parameters which can be modified to improve fit. Fine adjustments may be misleading. Adjusting an internal parameter to correct for noise or an exogenous factor may cause the modeler to change a reasonable parameter value to an unreasonable one. Third, some behavior modes in systems do not permit discrimination among different model structures. One such mode is exponential growth. When a system is experiencing exponential growth, most variables are moving in one direction, either up or down. Many possible model structures can reproduce this behavior, even though some may lead to incorrect policy conclusions.

Despite the limitations of whole model testing, it does provide a useful check on model behavior. Reasonable behavior is the first criterion a model must pass.

Summary of Comparisons

The reader is invited to examine the graphs that follow to compare the model with the data. To summarize the results:

- In California, Iowa, Massachusetts, and the Federal System, the model corresponded sufficiently well to justify its use for the scenarios. In particular, the model showed some of the major behavior modes seen in the system. In response to the large increase in crime, the increase in court commitments to prison rose much less. The role of the courts as a buffer between the increases in crime and prison inflows seemed to match actual data. In some cases, the model exhibited fluctuations of several years in prison population with the same general period and amplitude as in the actual data, Iowa being one such case. On the other hand, short term fluctuations often did not appear in the model and, in some cases, the longer term fluctuations were out of phase with the actual data.
- The model did not exhibit behavior characteristic of Illinois. Relying on crime to increase the flow of cases into court, the model did not generate the volume of prosecutions seen in Illinois. Throughout, the model fails to produce the actual marked increase in prison population. Due to this variation, the Illinois figures for the scenarios are unreliable.

- The lack of data for South Carolina does not permit a judgment on the ability of the model to match the situation in South Carolina.

- Although revisions in model structure, model assumptions and parameter estimations would increase the reliability of the model, the model provides a counterpart to projections based on extrapolations and illustrates possible changes in prison population.

Definition of Variables as they Appear on the Axis of each Set of Graphs

Set 1. Comparisons of Crimes, Court Cases Filed, and Court Commitments to Prison.

- *   Crimes (as measured by the FBI index)

- P Court Cases Filed
- O Court Commitments to Prisons

Set 2. Court Variables.

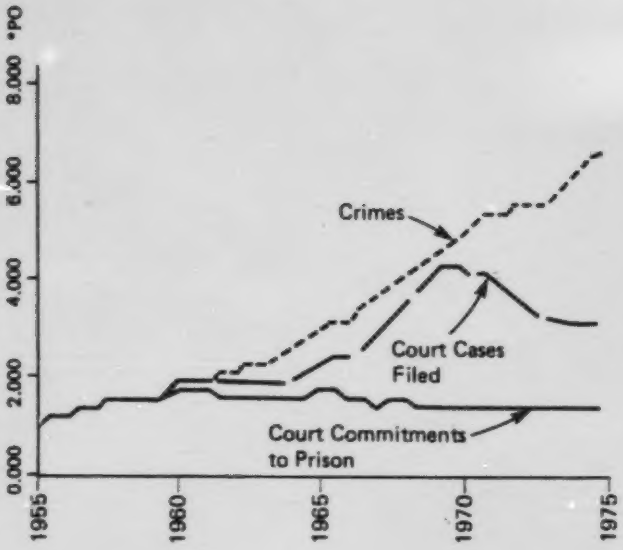
- P Court Cases Filed
- C Court Dispositions
- B Court Backlog
- F Fraction of Cases Resulting in Prison Sentences

Set 3. Correctional Variables.

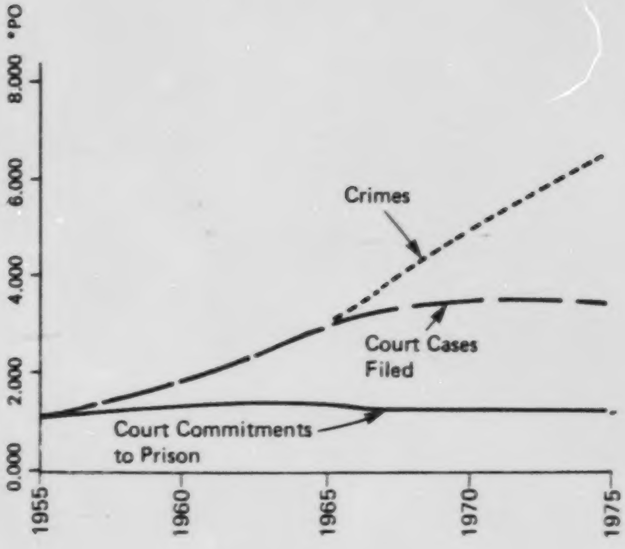
- P Prisoners
- I Total Prison Admissions
- O Court Commitments
- R Prisoners Released
- A Average Effective Sentence

Set 1.A

California – Comparison of Crimes, Court Cases Filed, and Court Commitments to Prison



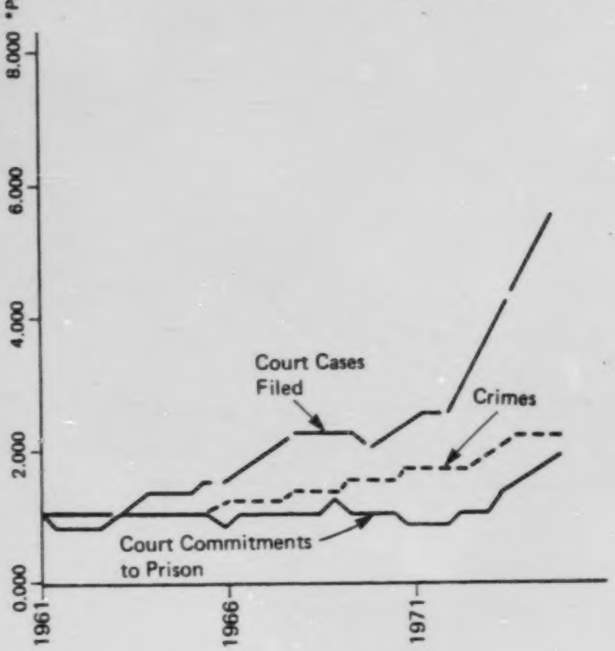
DATA FROM JURISDICTION



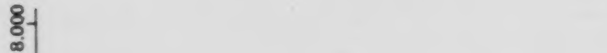
OUTPUT FROM MODEL

Set 1.B

Illinois – Comparison of Crimes, Court Cases Filed, and Court Commitments to Prison



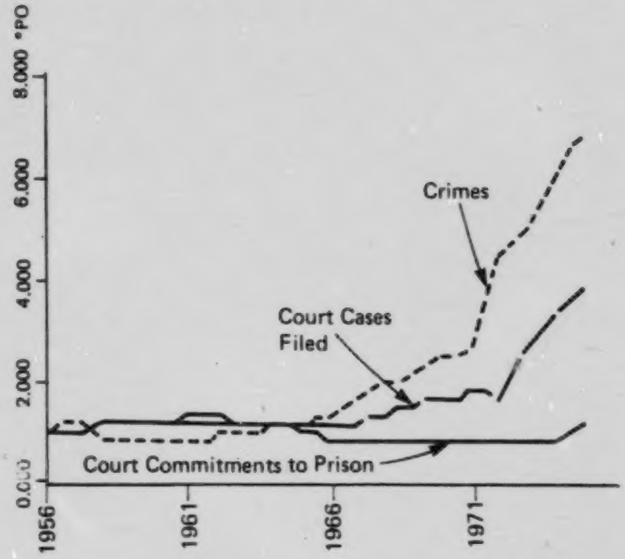
DATA FROM JURISDICTION



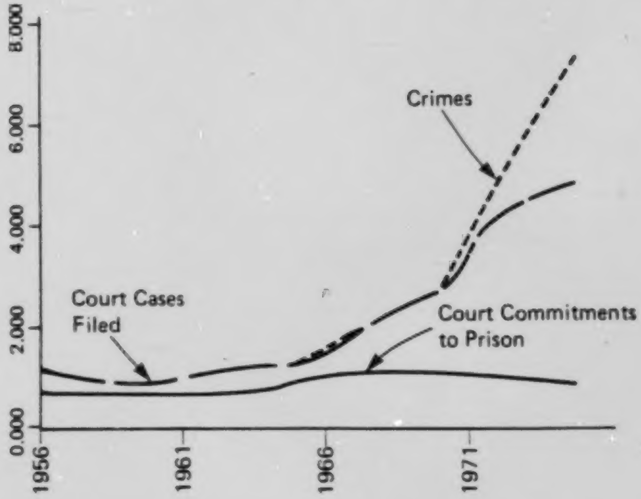
OUTPUT FROM MODEL

Set 1.C

Iowa – Comparison of Crimes, Court Cases Filed, and Court Commitments to Prison



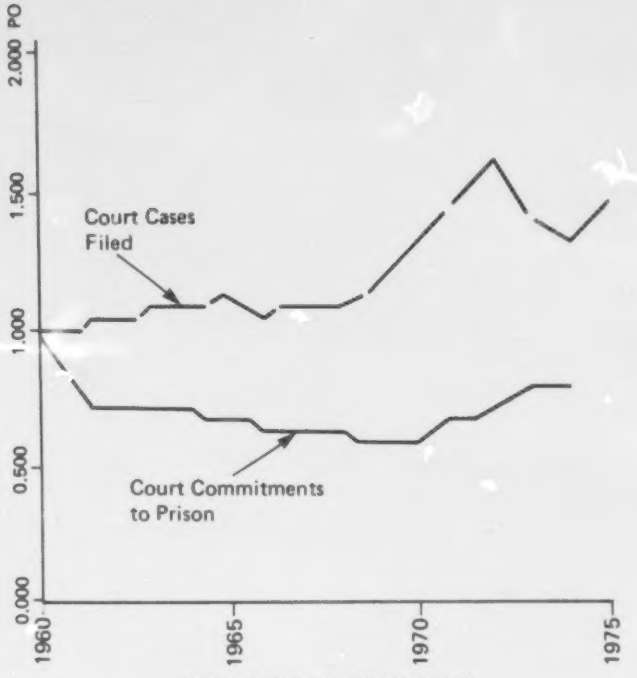
DATA FROM JURISDICTION



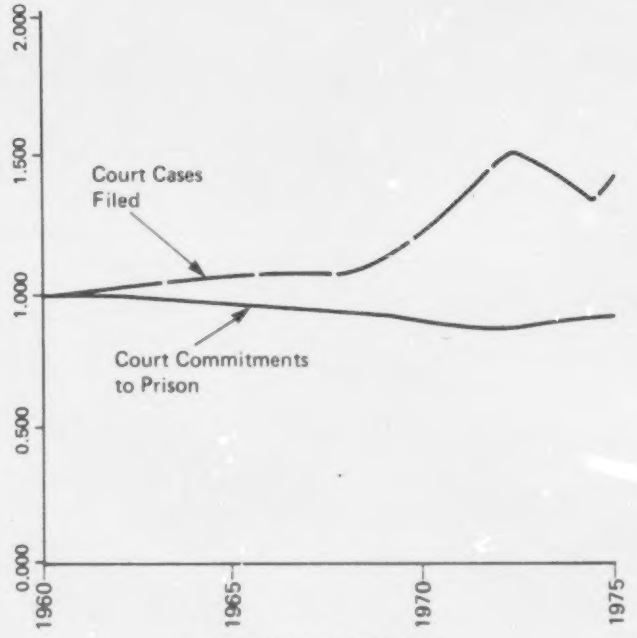
OUTPUT FROM MODEL

Set 1.D

U.S. Federal – Comparison of Crimes, Court Cases Filed, and Court Commitments to Prison



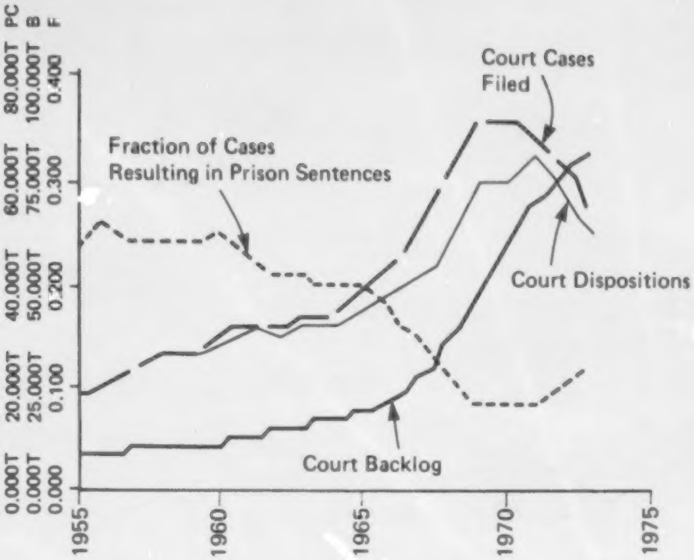
DATA FROM JURISDICTION



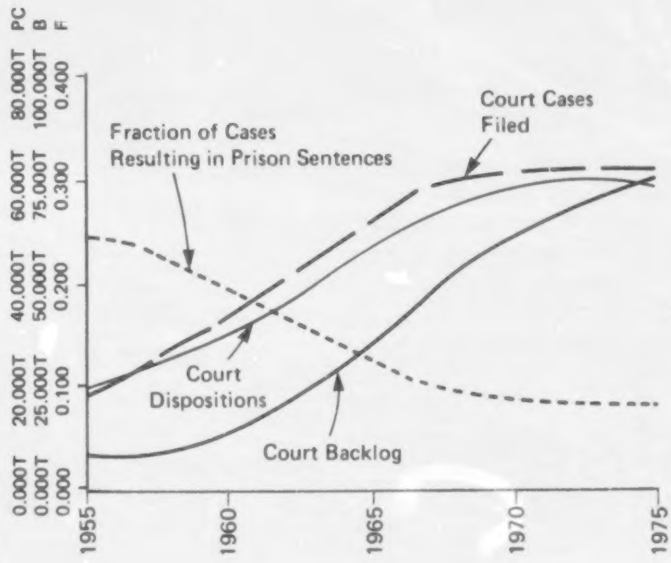
OUTPUT FROM MODEL

Set 2.A

California – Court Variables



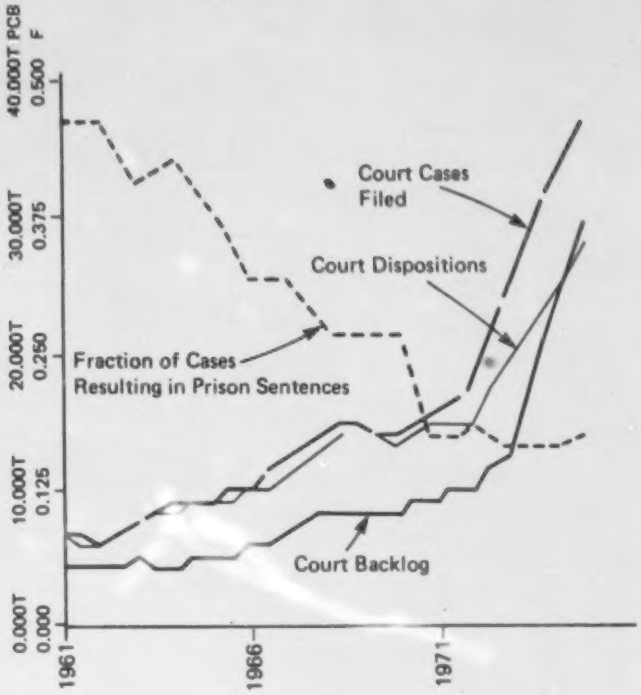
DATA FROM JURISDICTION



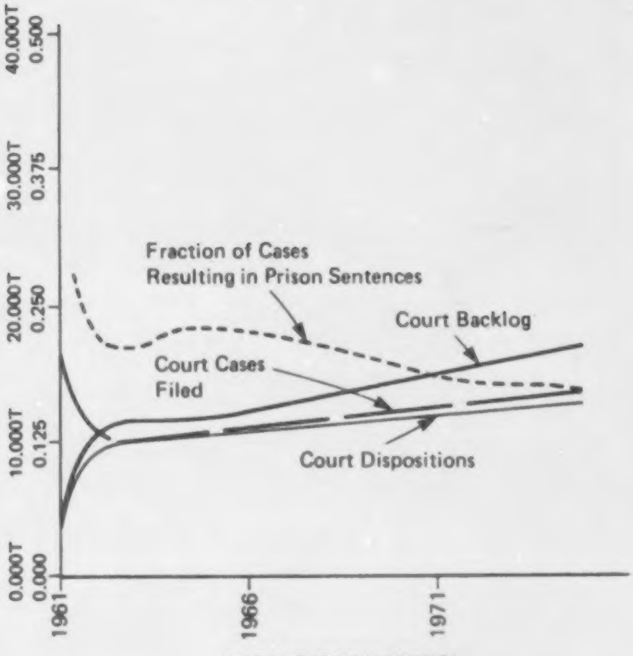
OUTPUT FROM MODEL

Set 2.B

Illinois – Court Variables



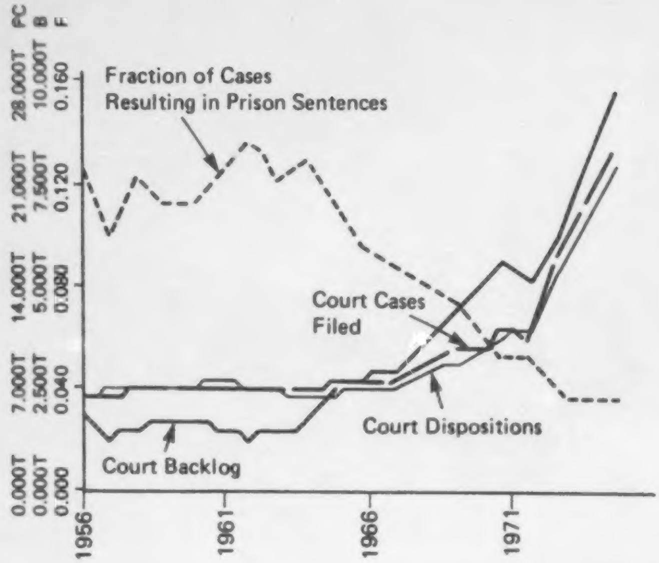
DATA FROM JURISDICTION



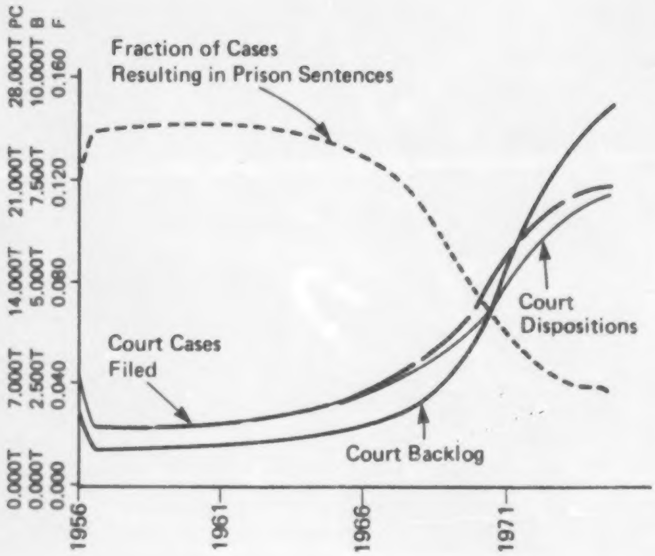
OUTPUT FROM MODEL

Set 2.C

Iowa – Court Variables



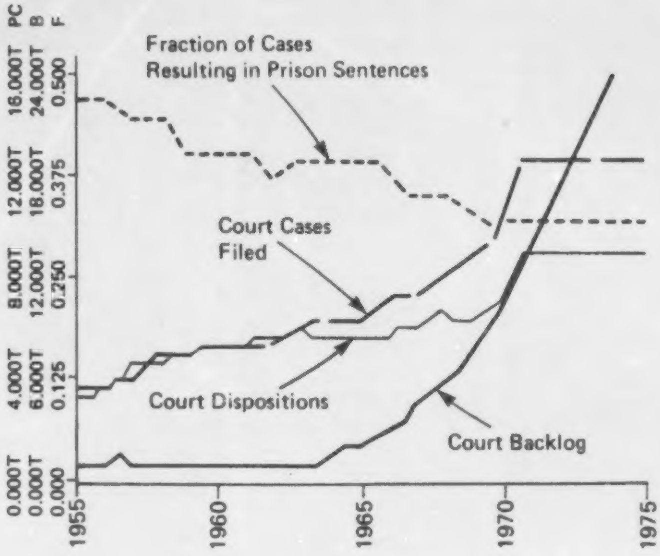
DATA FROM JURISDICTION



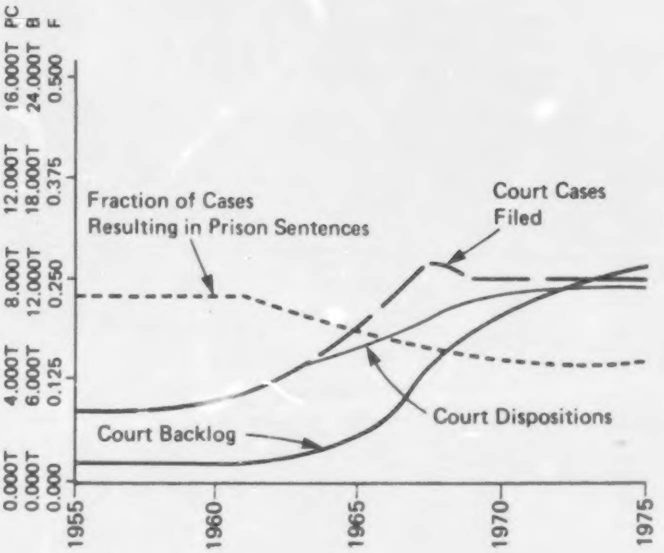
OUTPUT FROM MODEL

Set 2.D

Massachusetts – Court Variables



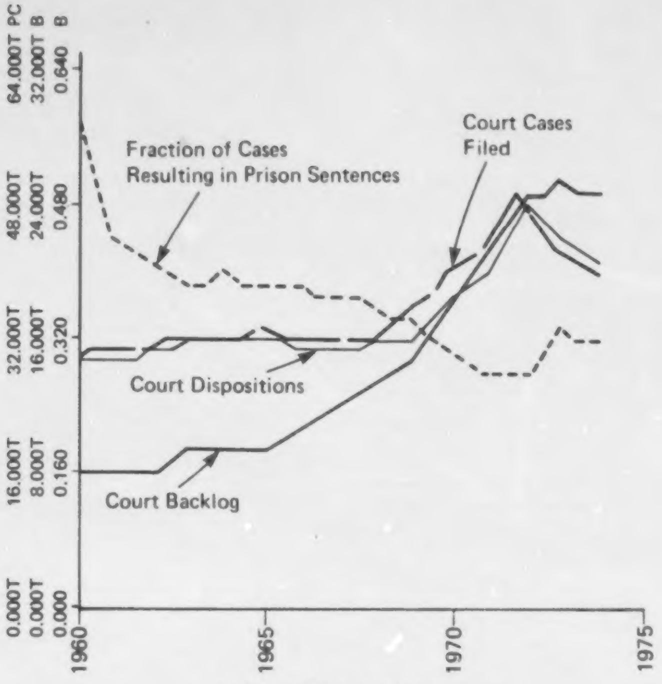
DATA FROM JURISDICTION



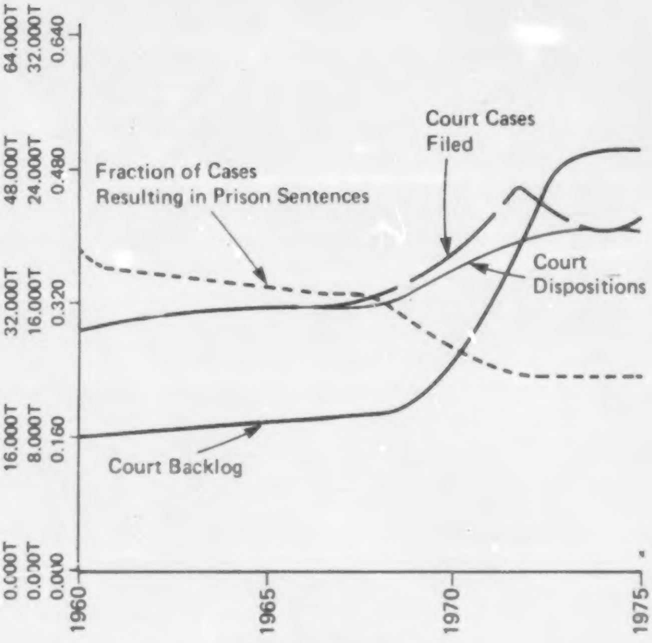
OUTPUT FROM MODEL

Set 2.E

U.S. Federal – Court Variables



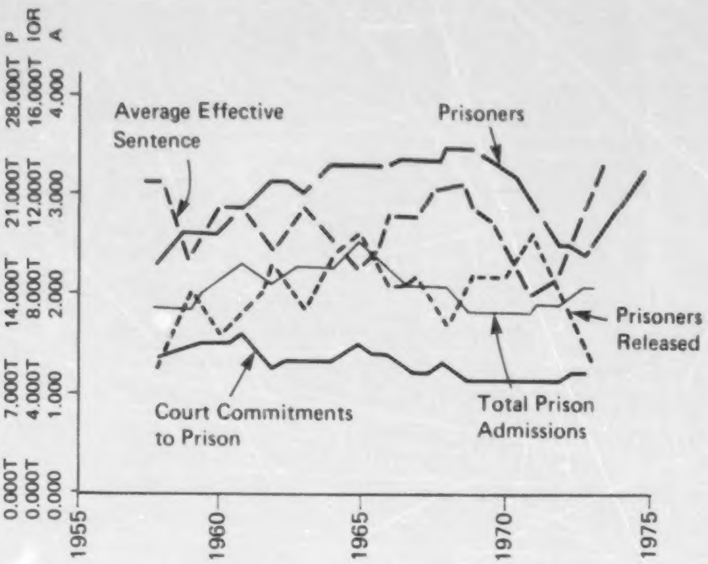
DATA FROM JURISDICTION



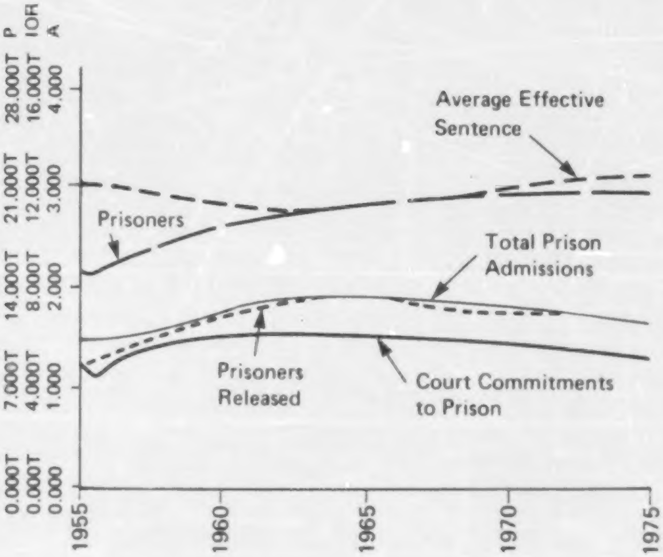
OUTPUT FROM MODEL

Set 3.A

California – Correctional Variables



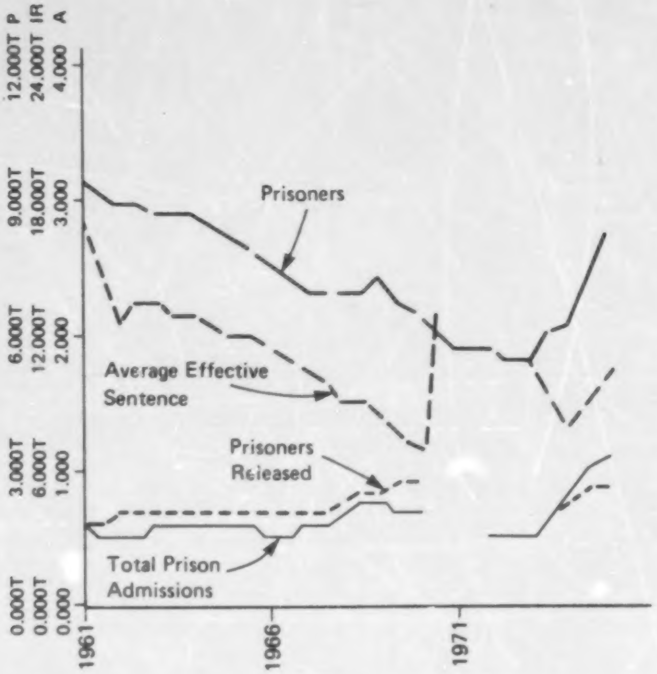
DATA FROM JURISDICTION



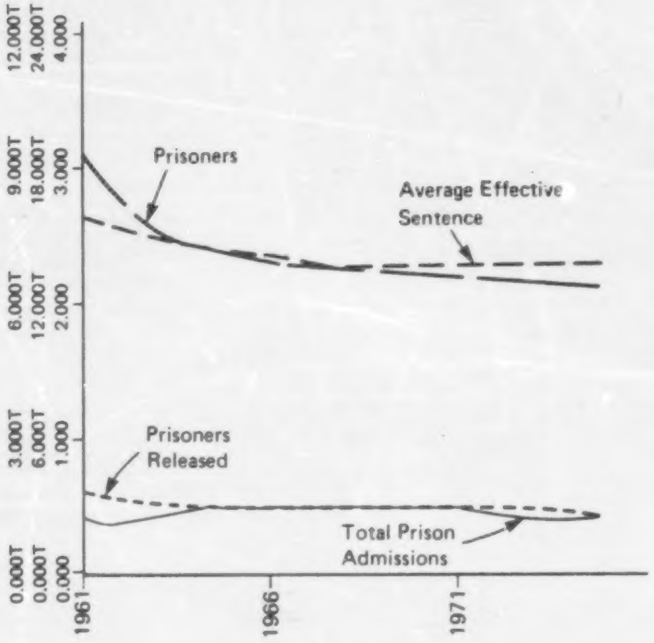
OUTPUT FROM MODEL

Set 3.B

Illinois – Correctional Variables



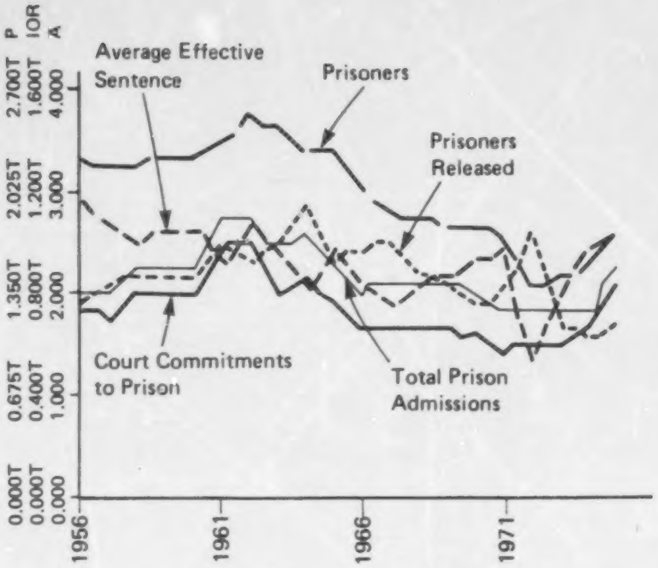
DATA FROM JURISDICTION



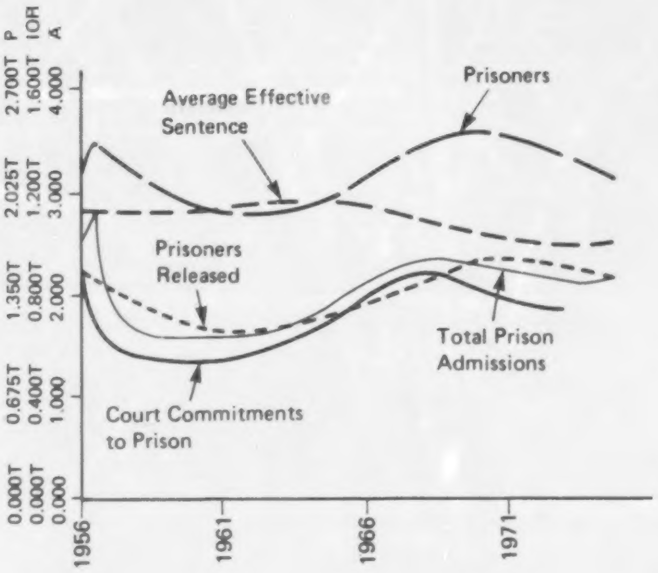
OUTPUT FROM MODEL

Set 3.C

Iowa – Correctional Variables



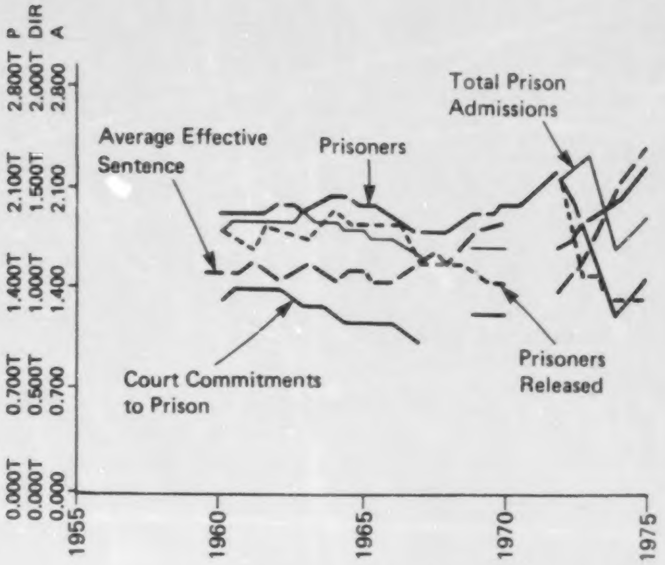
DATA FROM JURISDICTION



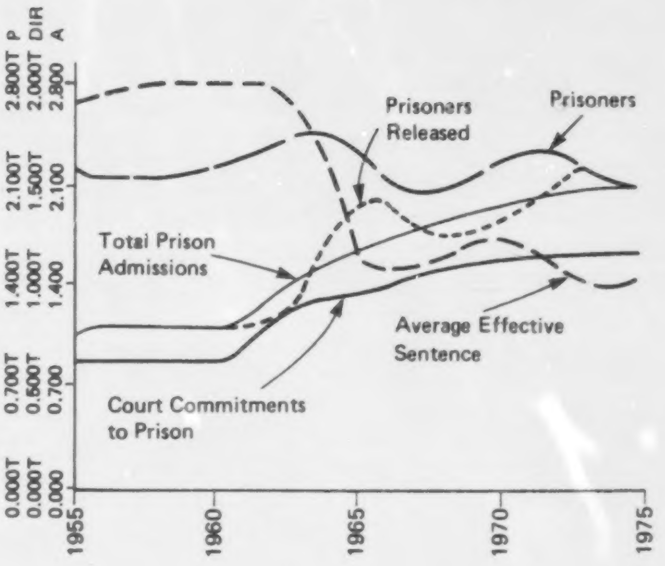
OUTPUT FROM MODEL

Set 3.D

Massachusetts – Correctional Variables



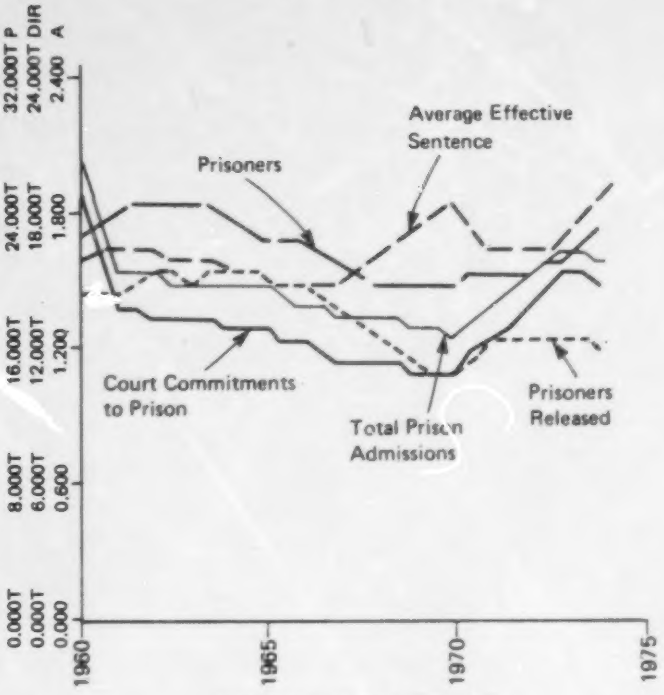
DATA FROM JURISDICTION



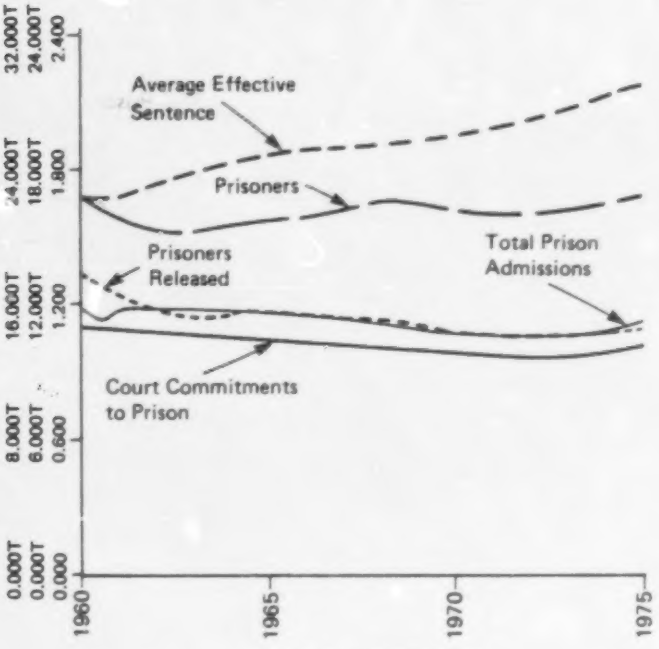
OUTPUT FROM MODEL

Set 3.E

U.S. Federal – Correctional Variables



DATA FROM JURISDICTION



OUTPUT FROM MODEL

Table 2.1

Comparison of Prison Population for California

Year	Actual Data	Model Output
1955	14440	14400
1956	14456	15138
1957	N/A	15851
1958	15788	16656
1959	17967	17369
1960	17872	17991
1961	19996	18500
1962	21845	18907
1963	21086	19195
1964	22936	19348
1965	22822	19419
1966	22766	19410
1967	23563	19193
1968	23668	19170
1969	24184	19350
1970	23016	19579
1971	21048	19774
1972	17474	19939
1973	16970	20084
1974	19794	20206
1975	22711	20300

Table 2.2

Comparison of Prison Population for Illinois

Year	Actual Data	Model Output
1961	9611	9600
1962	8928	8437
1963	8855	7827
1964	8753	7487
1965	8306	7291
1966	7491	7164
1967	7041	7057
1968	6886	6974
1969	7131	6093
1970	6381	6820
1971	5854	6729
1972	5630	6633
1973	5600	6547
1974	6208	6507
1975	8209	6499

Table 2.3

Comparison of Prison Population for Iowa

Year	Actual Data	Model Output
1956	2229	2200
1957	2210	2274
1958	2213	2146
1959	2235	2046
1960	2256	1968
1961	2341	1908
1962	2506	1894
1963	2447	1915
1964	2324	1958
1965	2287	2012
1966	2079	2074
1967	1898	2191
1968	1855	2325
1969	1818	2397
1970	1808	2411
1971	1760	2380
1972	1406	2305
1973	1451	2229
1974	1518	2185
1975	17[illegible]8	2161

Table 2.4

Comparison of Prison Population for Massachusetts

Year	Actual Data	Model Output
1960	1913	2189
1961	1920	2213
1962	1978	2307
1963	1947	2430
1964	2046	2478
1965	[illegible]	2335
1966	1929	2105
1967	1829	2004
1968	1824	2032
1969	1912	2139
1970	1966	2257
1971	2053	2342
1972	2203	2327
1973	1856	2222
1974	1981	2138
1975	2226	2127

Table 2.5

Comparison of Prison Population for South Carolina

Comparison of Prison Population for South Carolina

Year	Actual Data	Model Output
1974	4318	4300
1975	5600	5986

Table 2.6

Comparison of Prison Population for Federal System

Year	Actual Data	Model Output
1960	22838	22838
1961	23974	21559
1962	24925	21052
1963	24613	21002
1964	24248	21168
1965	22974	21424
1966	22345	21708
1967	21040	21974
1968	19815	22233
1969	20170	22316
1970	20208	22041
1971	20686	21709
1972	20820	21591
1973	21280	21805
1974	23336	22282
1975	23336	22834

III. METHOD USED TO SURVEY CORRECTIONS AGENCIES AND INSTITUTIONS

Data were collected from each of the fifty States, the District of Columbia, and the Federal system. Data were obtained from every correctional facility housing sentenced adults listed in the 1977 American Correctional Association Directory of Juvenile and Adult Correctional Departments, Institutions, Agencies and Paroling Authorities.* Including aggregated data from State owned and contracted prerelease facilities, we received 568 partially or fully completed PC-2 forms.

Phase I data collection activities began on June 14, 1977 with a period of staff training. From June 19 to June 21, we first contacted State Planning Agencies to identify central corrections agency officials in each State, and to inform the State Planning Agency of our study so they could validate its authenticity.

The central corrections agency respondent, as identified by the State Planning Agency Corrections Specialist or Planner, was then contacted by telephone. The goals of these calls were to

- Determine the availability of data that would be collected by our PC-1 and PC-2 forms so these instruments could be revised as necessary;**
- Request copies of all available reports and materials that might contain information useful for this study;
- Inform members of the central corrections agencies'

---

* The one exception to this statement was four work release centers in Tennessee.

** PC-1 and PC-2 forms are located at the end of this section.

statistics/research units about the forthcoming data collection effort; and

- Identify the chief adminstrator of each State's central corrections agency, so that questionnaires could be personally sent to these officials.

Additionally, if the State was one in which we wished to pretest our PC-1 and PC-2 questionnaires, arrangements were made to schedule a site visit.*

A master list of materials promised or received was prepared, to remind respondents to transmit the promised reports and materials.

Mail-out of Instruments

Data was collected for two major purposes: the projection of State-by-State populations for the years 1977 through 1982, and a preliminary assessment (using States' own definitions) of the capacity and adequacy of the institutions to hold inmates. Two forms were designed: one to collect information at the State level (PC-1) and one to collect information at the institutional level (PC-2). Form PC-1 was designed, primarily, to serve the first purpose by asking questions about prisoner movement and average daily population for the years 1970-76. In addition, data was requested on facility construction, renovation, acquisition, or destruction plans that would result in an increase or decrease in the system's rated capacity between June 30, 1977 and December 31, 1982. Form PC-2 was designed, primarily, to collect data on the number of inmates in the institution from 1970 to June 30, 1977 and on the adequacy of the facility to handle these inmates. Data on custodial staff salaries, institutional operating expenses, number of custodial personnel, overall rated capacity, number of cells or dorms rated to hold one, two, three, four, or five or more persons (and the number of inmates occupying these units), and square footage for living and program space were collected to gain a picture of prison adequacy. The results of this data collection effort are discussed in Chapter 3. The approval of the Office of Management and Budget for the survey instruments was received on July 8, 1977. Prior to mail-out of PC-1 and PC-2 instruments, the following materials were reviewed, and relevant data were abstracted and entered on these instruments, reducing respondent burden and facilitating completion of the questionnaires:

---

* Special protocols were prepared for this and all telephone contacts/recontacts.

- Bureau of Census documents--National Prisoner Statistics Bulletins, summarizing results of National Prisoner Statistics* data collections.

- Reports and materials received from State central corrections agencies, requested in the aforementioned phone calls.

- Pretest results.

On July 11, 1977 a PC-1 and several PC-2 forms were mailed to the chief administrator of the control corrections agency in each State. PC-2 forms were prepared for each State and for

- Each facility listed in the 1977 American Correctional Association Directory that might contain sentenced, nonjuvenile offenders;

- "State-owned Prerelease Facilities";

- "Contracted Prerelease Facilities".

Additional blank PC-2 forms were included in the package sent to each State, providing an opportunity for data collection on State institutions containing sentenced, nonjuvenile offenders not listed in the American Correctional Association Directory. A cover letter urging cooperation and identifying a contact person to answer questions was also included.

Follow-up Procedures for Nonrespondents

On July 19, 1977, contract staff initiated contact with States that had not returned their completed PC-1 and PC-2 questionnaires. An initial call was made to the office of the chief administrator of the central corrections agency (the designated respondent). This call was intended to

- Determine if the questionnaires had been received (so that duplicates could be mailed out, if necessary),

---

* Bureau of Census work sheets for 1972 and 1973, Prisoners in State and Federal Institutions on December 31, 1971, 1972 and 1973, Prisoners in State and Federal Institutions on December 31, 1974, Prisoners in State and Federal Institutions on December 31, 1975, and copies of verified Census Form NPS-1 for December 31, 1976 for all jurisdictions.

- Identify the person responsible for actually completing the instruments (so that this person could be contacted).

The person responsible for completing the questionnaire was contacted with the intention of

- Determining if the questionnaire had been received (so that, if necessary, duplicates could be mailed out);
- Resolving any difficulties respondents might be having in completing these questionnaires;
- Ascertaining if further assistance (site visits) might be needed to collect the desired data; and
- Requesting additional published data on time served by released prisoners.

Detailed Call Record Sheets were prepared for each State. Each contact attempt was recorded on these sheets. Frequent recontact was made to

- Assure whether remailed questionnaires had been received;
- Remind respondents to return their questionnaires as soon as possible;
- Identify and resolve special problems as they arose;
- Schedule site visits and/or organize special follow-up procedures, as necessary.

Whenever possible, data were collected by telephone. Site visits were employed as infrequently as possible.

Follow-up Procedures — Responders

Returned PC-1 forms were edited for completeness. If there were any ommissions, respondents were recontacted to ascertain the reason for these omissions. If the information was available, within reasonable effort, it was collected (by telephone whenever possible; in person when necessary).

Similar procedures were employed for the PC-2 forms. The PC-2 asks for institutional level data. Accordingly, these forms had been sent to the chief administrator of the Department of Corrections. As a result of recontacts, we were occasionally informed that some (or all) of the requested information was not available from the central authority, but might be obtainable through contact with individual institutions. In such cases, the central authority was asked to initiate this contact. Many States sent the PC-2 forms to the individual institutions on their own initiative. However, some problems arose

- When the central authority was either unwilling or unable to make such contact;
- When the individual institution was unable or unwilling to complete the PC-2 form; and
- When the individual institution filled out the questionnaire incorrectly.

When institutional contact was deemed necessary or when the central authority was unable to make such contact themselves, a phone call was made to the office of the chief administrator of the central corrections agency. The purposes of this call were to

- Request permission to contact the individual institutions, and
- Identify a person in the chief adminstrator's office who would verify the legitimacy of this research effort, in case the local institutions were skeptical about our information requests.

Names and telephone numbers for the institutional-level respondent came from either the central corrections agency or the 1977 American Correctional Association Directory. These wardens and other institutional officials were administered the PC-2, usually by phone. Frequent recontact was necessary to insure completeness for the requested data to be locally collected. In certain cases, PC-2 forms were mailed to specific institutions for completion. However, in light of time constraints, telephones were used to collect this data as often as possible.

When we received PC-2 forms that were incorrectly or partially filled out by institutional respondents, recontacts were made. Recontact with individual institutions was facilitated by people completing each form and entering their names and telephone numbers on the back of these forms. As problems were identified, further recontact attempts were initiated to provide resolution.

Report Period Covered: January 1, 1970 through December 31, 1982 OMB No. 43 - S77003; Approval Expires November 30, 1977

FORM PC-1
(7-1-77)

This report is authorized by law (PL 94-503). While you are not required to respond, your cooperation is needed to make the results of this survey comprehensive, accurate and timely.

PRISONER MOVEMENT

1970 - 1976

RETURN COMPLETED FORM TO

Abt Associates Inc.
Attn: Criminal Justice Area
55 Wheeler Street
Cambridge, MA 02138

(Please correct any error in name and address)

INSTRUCTIONS FOR COMPLETING FORMS PC-1 AND PC-2

Form PC-1, "Prisoner Movement 1970-1976," is designed to collect data on *all* inmates sentenced as adults or youthful offenders who have maximum sentence lengths of more than one year. In order to avoid duplication of effort, figures supplied by the Bureau of the Census have been included; please change them when they do not agree with current records.

Form PC-2, "Survey of State and Adult Correctional Facilities," is designed to collect data on *all* facilities in your system that house inmates sentenced as adults or youthful offenders who have maximum sentence lengths of more than one year. We have attempted to send a separate form for each facility in your system that might house such prisoners. If a facility is listed that does not contain such prisoners, please indicate this by writing "Not Applicable" on the PC-2 form. Several blank PC-2 forms are enclosed. Please complete them for any facilities in your system housing inmates sentenced as adults or youthful offenders who have maximum sentence lengths of more than one year that we have not pre-listed.

It is unnecessary to complete separate PC-2 forms for minimum security facilities with fewer than 100 prisoners. These facilities can be aggregated into two groups – state owned and contracted pre-release facilities. Please enter this aggregated data on the two PC-2 forms provided and indicate on the original PC-2 forms whether the facility was a state owned or contracted pre-release facility. Also, indicate any contracted pre-release facility with more than 100 prisoners by entering "Contracted pre-release facility" in the name block in the upper right-hand corner of form PC-2.

Please complete as many items on these questionnaires as possible and return them to us in the enclosed return envelope no later than Friday, 22 July. If you have any questions about how to complete any item, or if you need a site visit by any of our staff to assist you, please call Dr. Bradford Smith at (617) 492-7100, extension 333.

CATEGORY DEFINITIONS

- **COVERAGE** – The scope of this instrument covers **only** those inmates sentenced as adults or youthful offenders who have **maximum sentence lengths of more than one year,** and are remanded to the custody of the State adult correctional system.

1. **New commitments from courts** – Include only new commitments. Do **not** include parole violators, or escapees returned with additional sentences.

2. **Conditional-release violators** – Include those inmates released from adult correctional facilities through conditional release programs (parole, mandatory release, probation, and similar programs) who were returned to the jurisdiction of the State adult correction system for violating conditions of these programs **without** new sentences. If records do not permit distinction between columns 2 and 3, list combined figure in column 3 and enter N/A in column 2.

3. **Conditonal-release violators readmitted with a new sentence** – Include those inmates released through conditional release programs (parole, mandatory release, probation, and similar programs) who subsequently received **new** prison sentences. If records do not permit distinction between columns 1 and 3, list combined figures in column 1 and enter N/A in column 3.

4. **Other admissions** – Include **all** other admissions, e.g., escapees and AWOL's, including inmates returned from bond or appeal, and those inmates transferred to the authority of the State adult correctional system from another jurisdiction, i.e., other States, Department of Mental Hygiene, etc. Do **not** include intradepartmental movements from one facility to another, authorized temporary absences such as court appearances and hospital stays, or inmates referred from other jurisdictions to be held on a **temporary** basis (usually less than 30 days), e.g., detainers, protective custody cases, etc.

5. **Total admissions** – The sum of all admissions in columns 1 through 4.

6. **Unconditional releases** – Include expiration of sentence, pardon, commutation that results in immediate unconditional release, death (including execution), unconditional release to detainers, or other unconditional releases.

7. **Conditional releases** – Include inmates released through parole, inmates who serve a portion of their sentence under confinement of a State Correctional facility and then are released to discharge the remaining amount of their term in probationary status, inmates with supervised mandatory release (e.g., inmates who have served their maximum sentence length less deductions for good time and are released to street supervision for a specified period of time), inmates conditionally released to detainers, or other conditional releases.

8. **Other departures** – Include all escapees and AWOL's including absconders from furlough, inmates released to bond or appeal, and inmates transferred from the authority of the State adult correctional system to another jurisdiction, i.e., other States, Department of Mental Hygiene, etc. Do **not** include intradepartmental movements from one facility to another, authorized temporary absences such as court appearances, hospital stays, or inmates referred from other jurisdictions to be held on a **temporary** basis (usually less than 30 days), e.g., detainers, protective custody cases, etc.

9. **Total releases** – The sum of all releases in columns 6, 7, and 8.

10. **Inmate count on December 31** – The actual count on December 31 for a given year should agree with the number that results from adding total admissions (column 5) and subtracting total releases (column 9) from the inmate count on December 31 from the previous year (column 10).

11. **Average daily population** – The average (mean) of the number of inmates in the correctional system on each day of the year. Include those on temporary authorized absences, such as short furlough, hospitalization, etc. Do **not** include those who have escaped or those on indefinite absences, such as indefinite commitment to mental health facilities or those on indefinite home furlough programs.

12. **Rated capacity on December 31** – The phrase "rated capacity" is equivalent to the phrase "ordinary capacity" or "design capacity." It assumes cells (rooms) designed for one person hold one person; program space is used for programs, not dorms; hospital beds are reserved for hospital use; no beds are in hallways, corridors, tents, etc., and a few beds are vacant to allow some flexibility.

FORM PC-1 (7-1-77)

PRISONER MOVEMENT

NUMBER OF PRISONERS WITH OVER ONE YEAR MAXIMUM SENTENCE

		Admissions					Departures						
		1. New commitments from courts	2. Conditional release violaters	3. Conditional release violaters readmitted with a new sentence	4. Other admissions	5. Total admissions (Sum of columns 1-4)	6. Unconditional releases	7. Conditional releases	8. Other departures	9. Total departures (Sum of columns 6-8)	10. Inmate count on December 31	11. Average daily population	12. Rated capacity on December 31
Male	**1970**												
	1971												
	1972												
	1973												
	1974												
	1975												
	1976												
Female	**1970**												
	1971												
	1972												
	1973												
	1974												
	1975												
	1976												

PLEASE COMPLETE ITEMS 13 THROUGH 16 ON PAGE 4

PRISONER MOVEMENT—Continued

13. What was the total rated capacity for your system on June 30, 1977? ____________

14. If there are any new facility construction, renovation or acquisition plans that will result in an increase in your system's rated capacity between June 30, 1977 and December 31, 1982, please describe them below. (If there are no such plans, enter "None" in the "Facility" column.)

Year available	Facility	Number of beds to be added	Total estimated cost

15. If there are any plans that will result in a decrease in your system's rated capacity between June 30, 1977 and December 31, 1982, please describe them below. (If there are no such plans, enter "None" in the "Facility" column.)

Year	Facility	Number of beds to be removed

16. REPORT COMPLETED BY

Name	Telephone			Date Completed
	Area Code	Number	Extension	

Report Period Covered: January 1, 1970 through December 31, 1977

OMB No. 43-S77003; Approval Expires November 30, 1977

FORM FC-2
(7-1-77)

This report is authorized by law (PL 94-503). While you are not required to respond, your cooperation is needed to make the results of this survey comprehensive, accurate and timely.

SURVEY OF STATE AND FEDERAL ADULT CORRECTIONAL FACILITIES

RETURN COMPLETED FORM TO

Abt Associates Inc.
Attn: Criminal Justice Area
55 Wheeler Street
Cambridge, MA 02138

(Please correct any error in name and address)

1. On June 30, 1977, how many inmates in this facility with maximum sentence lengths of more than one year were confined under each of the types of security listed?

Minimum ____________

Medium ____________

Maximum ____________

2. For fiscal year 1977, how much money is budgeted for:

a) Custodial Staff salaries? $ ____________

b) Total institutional operating expenses (including custodial staff salaries)? $ ____________

3. On June 30, 1977, how many full time custodial personnel (guards, correctional officers, etc.), were employed at this institution? ____________

	Inmate count on December 31			
	4. Prisoners with over one year maximum sentence	5. Prisoners with a year or less maximum sentence	6. Average daily population	7. Rated capacity on December 31
1970				
1971				
1972				
1973				
1974				
1975				
1976				

*The phrase "rated capacity" is equivalent to the phrases "ordinary capacity" or "design capacity". It assumes cells (rooms) designed for one person hold one person; program space is used for programs, not dorms; hospital beds are reserved for hospital use; no beds are in hallways, corridors, tents, etc.; and a few beds are vacant to allow some flexibility.

PLEASE COMPLETE ITEMS 8 THROUGH 14 ON OTHER SIDE OF PAGE

SURVEY OF STATE AND FEDERAL ADULT CORRECTIONAL FACILITIES—Continued

8. How much space in your facility is occupied by:

a) Cells containing less than five persons? ________ square feet

b) Dorms containing five or more persons? ________ square feet

c) Total cell and dorm space (a+b) ________ square feet

d) Program and other enclosed space? ________ square feet

e) Total enclosed space (c+d) ________ square feet

9a. How many cells are rated to hold one person? ________

b. What is the number of inmates who actually occupy these cells today? ________

10a. How many cells are rated to hold two persons? ________

b. What is the number of inmates who actually occupy these cells today? ________

11a. How many cells are rated to hold three or four persons? ________

b. What is the number of inmates who actually occupy these cells today? ________

12a. How many cells or dorms are rated to hold five or more persons? ________

b. What is the number of inmates who actually occupy these cells or dorms today? ________

13. How many inmates are assigned to cells of which they:

a. were the only occupants today? ________

b. share with exactly one other inmate? ________

c. share with either two or three other inmates? ________

d. share with four or more other inmates? ________

COMMENTS

14. REPORT COMPLETED BY	Name	Telephone		Date Completed
		Area Code	Number	Extension

FORM PC-2 (7-1-77)

IV. RESULTS OF THE DYNAMIC MODELING EXERCISE

Table 4.1

Prison Population for Base Run — Simple Flow Model

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	18,613	1,935	2,779	6,328	26,589
1977	19,553	2,056	3,159	6,785	28,179
1978	20,019	2,131	3,345	6,968	28,847
1979	20,207	2,170	3,418	7,026	29,069
1980	20,274	2,188	3,444	7,042	29,134
1981	20,296	3,196	3,452	7,046	29,151
1982	20,302	2,199	3,455	7,047	29,155

Table 4.2

Prison Population for Base Run — Dynamic Modeling Approach

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	20,416	2,137	2,186	7,274	23,689
1977	20,457	2,127	2,219	7,575	23,958
1978	20,505	2,117	2,240	7,768	24,169
1979	20,584	2,107	2,244	7,893	24,370
1980	20,688	2,095	2,226	7,991	24,596
1981	20,809	2,083	2,205	8,051	24,867
1982	20,941	2,070	2,198	8,101	25,186

Table 4.3

Prison Population Under General Law and Order Scenario – Simple Flow Model

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	18,613	1,935	2,779	6,328	26,589
1977	19,553	2,056	3,159	6,785	28,179
1978	22,480	2,356	3,774	8,045	33,097
1979	24,682	2,599	4,209	8,909	36,558
1980	25,980	2,765	4,457	9,342	38,364
1981	26,631	2,865	4,578	9,523	39,148
1982	26,925	2,921	4,631	9,589	39,452

Table 4.4

Prison Population Under General Law and Order Scenario – Dynamic Modeling Approach

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	20,416	2,137	2,186	7,274	23,689
1977	20,457	2,127	2,219	7,575	23,958
1978	22,550	2,249	2,415	8,764	25,269
1979	24,137	2,305	2,405	9,502	26,120
1980	25,100	2,323	2,210	9,826	26,769
1981	25,583	2,318	2,059	9,933	27,299
1982	25,833	2,303	2,033	9,950	27,773

Table 4.5

Prison Population Under Reduced Imprisonment Rate Scenario — Simple Model Flow

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	18,613	1,935	2,779	6,328	26,589
1977	19,553	2,056	3,159	6,785	28,179
1978	17,200	1,867	2,847	5,735	23,978
1979	15,584	1,705	2,595	5,127	21,478
1980	14,930	1,615	2,491	4,942	20,666
1981	14,725	1,576	2,458	4,899	20,466
1982	14,669	1,561	2,449	4,890	20,423

Table 4.6

Prison Population Under Reduced Imprisonment Rate Scenario — Dynamic Modeling Approach

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	20,416	2,137	2,186	7,274	23,689
1977	20,457	2,127	2,219	7,575	23,95[illegible]
1978	18,918	1,877	1,918	6,243	21,293
1979	17,853	1,711	1,813	5,779	19,862
1980	17,346	1,624	1,851	5,778	19,605
1981	17,190	1,582	1,951	5,983	20,027
1982	17,248	1,562	2,067	6,216	20,804

Table 4.7

Prison Population Under Mandatory Minimums — Personal Danger Scenario — Simple Flow Model

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	18,613	1,935	2,779	6,328	N/A
1977	19,553	2,056	3,159	6,785	N/A
1978	20,221	2,077	3,498	7,229	N/A
1979	20,552	2,072	3,680	7,451	N/A
1980	20,741	2,063	3,759	7,532	N/A
1981	20,741	2,057	3,788	7,557	N/A
1982	20,758	2,054	3,798	7,563	N/A

Table 4.8

Prison Population Under Mandatory Minimums — Personal Danger Scenario — Dynamic Modeling Approach

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	20,416	2,137	2,186	7,274	N/A
1977	20,457	2,127	2,219	7,575	N/A
1978	20,614	2,065	2,343	8,134	N/A
1979	20,774	2,023	2,330	8,390	N/A
1980	20,933	1,995	2,212	8,521	N/A
1981	21,090	1,975	2,131	8,608	N/A
1982	21,245	1,959	2,127	8,710	N/A

Table 4.9

Prison Population Under Persistent Offender Scenario – Simple Flow Model

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	18,613	1,935	2,779	6,328	26,589
1977	19,553	2,056	3,159	6,785	28,179
1978	22,270	2,134	3,355	7,004	28,975
1979	20,727	2,206	3,519	7,346	30,247
1980	21,563	2,292	3,692	7,744	31,788
1981	22,282	2,377	3,831	8,034	32,955
1982	22,772	2,445	3,924	8,198	33,645

Table 4.10

Prison Population Under Persistent Offender Scenario – Dynamic Modeling Approach

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	20,416	2,137	2,186	7,274	23,689
1977	20,457	2,127	2,219	7,575	23,958
1978	21,247	2,215	2,396	8,406	25,395
1979	22,521	2,293	2,432	8,962	26,678
1980	22,521	2,332	2,254	9,222	27,497
19[illegible]	22,851	2,345	2,076	9,324	27,993
1982	23,077	2,341	2,036	9,357	28,312

Table 4.11

Prison Population Under Determinate Sentencing Scenario – Dynamic Modeling Approach

Year	California	Iowa	Massachusetts	South Carolina	Feseral Bureau Of Prisons
1976	18,613	1,935	2,779	6,328	26,589
1977	19,553	2,056	3,159	6,785	28,179
1978	19,585	2,107	3,294	6,911	28,509
1979	19,463	2,126	3,332	6,933	28,513
1980	19,376	2,132	3,341	6,934	28,486
1981	19,336	2,134	3,342	6,934	28,473
1982	19,321	2,135	3,342	6,934	28,468

Table 4.12

Prison Population Under Determinate Sentencing Scenario – Simple Flow Model

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	20,416	2,137	2,186	7,274	23,689
1977	20,457	2,127	2,219	7,575	23,958
1978	19,026	2,036	1,964	7,768	23,374
1979	18,128	1,977	1,885	7,893	23,169
1980	17,666	1,940	1,915	8,045	23,286
1981	17,521	1,918	2,002	8,227	23,630
1982	17,592	1,906	2,098	8,370	24,099

Table 4.13

Prison Population Under Judicial Intervention Scenario — Dynamic Modeling Approach

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	20,416	2,137	2,186	7,274	23,689
1977	20,457	2,127	2,219	7,575	23,958
1978	20,353	2,113	2,160	6,831	23,845
1979	19,817	2,083	1,741	6,626	22,373
1980	18,992	2,039	1,496	6,646	20,709
1981	18,261	1,987	1,474	6,710	19,868
1982	17,769	1,926	1,493	6,771	19,754

Table 4.14

Prison Population Under Prison Construction Scenario — Dynamic Modeling Approach

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	20,416	2,137	2,186	7,274	23,689
1977	20,457	2,127	2,219	7,575	23,958
1978	20,505	2,117	2,240	7,768	24,169
1979	20,587	2,107	2,250	7,897	24,374
1980	20,717	2,102	2,272	8,031	24,644
1981	20,906	2,104	2,328	8,170	25,031
1982	21,142	2,112	2,418	8,383	25,527

Table 4.15

Prison Population under Prison Alternatives Scenario — Dynamic Modeling Approach

Year	California	Iowa	Massachusetts	South Carolina	Federal Bureau Of Prisons
1976	20,416	2,137	2,186	7,274	23,689
1977	20,457	2,127	2,219	7,575	23,958
1978	18,617	1,884	2,012	7,115	21,699
1979	18,106	1,858	2,080	7,331	21,937
1980	18,072	1,852	2,153	7,557	22,508
1981	18,188	1,849	2,212	7,666	23,175
1982	18,373	1,846	2,249	7,733	23,839

V. RESULTS OF THE POLICY-BLIND PROJECTIONS

FEDERAL SYSTEM

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	...
1972	...	...	...	...	...	...	20919
1973	...	...	...	...	...	...	21833
1974	13843	15404	29247	6977	22786	29763	21367
1975	15880	15927	31807	7139	23009	30148	23026
1976	16311	16126	32437	4800	25234	30034	25429

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	30842	32437	29714	31172	26556	26744	500
1978	30842	32437	29714	32262	27684	26919	707
1979	30842	32437	29714	32437	28811	26919	865
1980	30842	32437	29714	32437	29939	26919	999
1981	30842	32437	29714	32437	31066	26919	1117
1982	30842	32437	29714	32437	32194	26919	1223

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	...
1972	...	...	...	...	...	...	794
1973	...	...	...	...	...	...	932
1974	668	719	1387	293	1032	1325	994
1975	890	763	1653	346	1196	1542	1105
1976	1126	853	1979	228	1486	1714	1370

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	1683	1979	1539	1631	1514	1718	124
1978	1683	1979	1539	1916	1658	1781	175
1979	1683	1979	1539	1979	1802	1781	214
1980	1683	1979	1539	1979	1946	1781	247
1981	1683	1979	1539	1979	2090	1781	[illegible]
1982	1683	1979	1539	1979	2234	1781	[illegible]

ALABAMA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	1309	...	...	...	...	...	3660
1971	1581	...	...	...	...	...	3706
1972	1655	973	2628	1291	1275	2566	3768
1973	1753	681	2434	1363	1047	2410	3543
1974	1909	562	2462	1261	993	2254	4074
1975	1855	729	2584	1321	1111	2432	4226
1976	467	984	1451	1637	1817	2854	2823

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	1942	1451	2182	2661	2583	1612	106
1978	1942	1451	2182	2081	2343	982	150
1979	1942	1451	2182	1451	2103	982	183
1980	1942	1451	2182	1451	1863	982	212
1981	1942	1451	2182	1451	1623	982	237
1982	1942	1451	2182	1451	1383	982	259

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	88	...	...	...	...	...	130
1971	71	...	...	...	...	...	117
1972	71	17	88	65	27	92	113
1973	101	10	111	45	29	74	150
1974	109	9	118	63	20	83	185
1975	99	33	132	97	26	123	194
1976	139	15	154	72	67	139	209

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	132	154	113	109	229	253	35
1978	132	154	113	127	248	280	49
1979	132	154	113	154	268	280	60
1980	132	154	113	154	288	280	69
1981	132	154	113	154	307	280	77
1982	132	154	113	154	327	280	85

ALASKA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	89
1972	216	26	242	112	139	251	180
1973	211	11	222	79	156	235	167
1974	188	9	197	70	119	189	175
1975	181	39	220	95	98	193	194
1976	132	61	193	63	106	169	226

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	207	193	188	224	246	195	39
1978	207	193	188	209	265	179	55
1979	207	193	188	193	285	179	67
1980	207	193	188	193	305	179	78
1981	207	193	188	193	324	179	87
1982	207	193	188	193	344	179	95

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	2
1972	4	0	4	1	2	3	3
1973	19	0	19	6	9	15	7
1974	14	0	14	9	4	13	8
1975	20	0	20	3	10	13	15
1976	11	1	12	3	10	13	4

ARIZONA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	587	...	...	808	1462
1971	...	...	682	...	...	755	1369
1972	628	151	779	347	248	595	1553
1973	743	98	841	436	251	687	1707
1974	1015	110	1125	361	327	688	2144
1975	1366	126	1492	471	429	900	2736
1976	1302	248	1550	820	548	1368	2918

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	1116	1550	806	1420	3228	3047	110
1978	1116	1550	806	1575	3538	3022	155
1979	1116	1550	806	1550	3847	3022	190
1980	1116	1550	806	1550	4157	3022	219
1981	1116	1550	806	1550	4467	3022	245
1982	1116	1550	806	1550	4777	3022	268

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	25	...	...	32	44
1971	...	...	28	...	...	30	42
1972	27	7	34	18	10	28	48
1973	33	1	34	21	7	28	54
1974	47	9	56	16	20	36	74
1975	88	7	95	26	33	59	110
1976	64	16	80	26	38	64	126

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	54	80	37	83	143	122	25
1978	54	80	37	92	160	110	36
1979	54	80	37	80	176	110	43
1980	54	80	37	80	193	110	50
1981	54	80	37	80	210	110	56
1982	54	80	37	80	227	110	61

ARKANSAS

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	1616
1972	965	322	1287	1008	323	1331	1572
1973	1075	225	1300	1009	242	1251	1621
1974	1291	328	1619	1054	185	1239	1871
1975	1591	399	1990	1459	323	1782	2079
1976	1166	541	1707	1285	178	1463	2323

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	1497	1707	1309	[illegible]	2511	2241	115
1978	1497	1707	1309	[illegible]	2698	2141	162
1979	1497	1707	1309	1707	2886	2161	199
1980	1497	1707	1309	1707	3074	2141	230
1981	1497	1707	1309	1707	3262	2141	257
1982	1497	1707	1309	1707	3449	2141	281

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	42
1972	45	5	50	42	3	45	47
1973	63	0	63	45	7	52	58
1974	76	0	76	56	5	61	67
1975	97	1	98	77	5	82	83
1976	116	2	118	87	6	93	108

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	84	118	69	88	123	138	31
1978	84	118	69	109	138	146	43
1979	84	118	69	118	154	146	53
1980	84	118	69	118	169	146	61
1981	84	118	69	118	184	146	68
1982	84	118	69	118	199	146	[illegible]

CALIFORNIA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	4426	6603	11029	8016	4903	12919	20460
1971	4472	7331	11803	9489	5822	15311	16952
1972	4272	8543	12815	7288	6009	13297	16470
1973	4830	8819	13648	5022	5929	10951	19167
1974	5081	6755	11836	4874	4846	9720	21283
1975	5433	3626	9059	10578	3166	13744	16508
1976	6463	4578	11041	6958	3222	10180	17459

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	11928	11041	11681	9500	17706	19000	292
1978	11928	11041	11681	10413	17953	19628	412
1979	11928	11041	11681	11041	18201	19628	505
1980	11929	11041	11681	11041	18448	19628	583
1981	11928	11041	11681	11041	18695	19628	652
1982	11928	11041	11681	11041	18942	19628	714

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	264	340	604	500	182	682	588
1971	316	397	713	525	254	779	522
1972	307	359	666	464	224	688	500
1973	308	402	710	351	232	583	627
1974	278	294	572	381	204	585	614
1975	332	277	609	286	239	525	698
1976	447	279	726	468	302	770	654

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	696	726	657	669	692	711	75
1978	696	726	657	707	731	730	106
1979	696	726	657	726	769	730	130
1980	696	726	657	726	808	730	150
1981	696	726	657	726	846	730	168
1982	696	726	657	726	885	730	183

COLORADO

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	829	...	...	...	...	...	2030
1971	965	...	...	...	...	...	1877
1972	1050	594	1644	1042	583	1625	1856
1973	1036	484	1520	1077	472	1549	1827
1974	1133	334	1467	1089	306	1395	1899
1975	1370	273	1643	1276	297	1573	1969
1976	1247	247	1494	1064	237	1301	2162

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	1507	1494	1395	1348	2274	2308	108
1978	1507	1494	1395	1595	2385	2207	152
1979	1507	1494	1395	1494	2497	2207	186
1980	1507	1494	1395	1494	2609	2207	215
1981	1507	1494	1395	1494	2720	2207	240
1982	1507	1494	1395	1494	2832	2207	263

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	45	...	...	...	...	...	85
1971	50	...	...	...	...	...	80
1972	50	17	67	73	5	78	69
1973	53	18	71	37	36	73	67
1974	54	14	68	41	25	66	69
1975	69	32	101	77	23	100	70
1976	64	24	88	55	26	81	77

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	79	88	76	70	80	95	27
1978	79	88	76	94	84	89	37
1979	79	88	76	88	87	89	46
1980	79	88	76	88	90	89	53
1981	79	88	76	88	94	89	59
1982	79	88	76	88	97	89	64

CONNECTICUT

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	1858
1972	1085	352	1437	948	616	1564	1731
1973	1011	355	1366	1083	434	1517	1580
1974	972	300	1272	913	538	1451	1401
1975	1420	412	1832	866	581	1447	1786
1976	1119	393	1512	874	550	1424	1874

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	1392	1512	1155	1546	2110	1840	108
1978	1392	1512	1155	1657	2347	1694	153
1979	1392	1512	1155	1512	2583	1694	187
1980	1392	1512	1155	1512	2820	1694	216
1981	1392	1512	1155	1512	3056	1694	242
1982	1392	1512	1155	1512	3293	1694	265

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	80
1972	73	34	107	85	15	100	87
1973	79	37	116	98	22	120	83
1974	72	30	102	65	57	122	63
1975	72	17	89	60	29	89	63
1976	88	34	122	78	58	136	49

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	112	122	119	106	42	64	31
1978	112	122	119	113	35	74	44
1979	112	122	119	122	28	74	54
1980	112	122	119	122	21	74	62
1981	112	122	119	122	14	74	69
1982	112	122	119	122	7	74	75

DELAWARE

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	180
1972	125	62	187	75	19	94	273
1973	214	52	266	110	110	220	319
1974	296	53	349	187	54	241	427
1975	336	86	422	200	84	284	565
1976	363	64	427	276	51	327	665

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	346	427	249	388	762	704	58
1978	346	427	249	420	859	711	82
1979	346	427	249	427	956	711	100
1980	346	427	249	427	1053	711	115
1981	346	427	249	427	1150	711	129
1982	346	427	249	427	1247	711	141

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	6
1972	2	1	3	3	0	3	6
1973	7	1	8	7	1	8	6
1974	4	1	5	2	0	2	9
1975	18	4	22	4	10	14	17
1976	17	3	20	10	8	18	19

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	14	20	11	17	22	22	13
1978	14	20	11	20	24	21	18
1979	14	20	11	20	27	21	22
1980	14	20	11	20	29	21	25
1981	14	20	11	20	32	21	28
1982	14	20	11	20	35	21	31

DISTRICT OF COLUMBIA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	1196	4531	5727	258	4661	4919	1423
1971	...	...	...	...	...	...	2600
1972	3039	4285	7324	1141	5922	7063	2500
1973	1800	1121	2921	1265	1825	3090	2331
1974	2480	1096	3576	1540	2312	3852	2055
1975	2780	1122	3902	1139	2542	3681	2276
1976	2484	1199	3683	1088	2651	3739	2220

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	4705	3683	4572	3540	2353	2363	169
1978	4705	3683	4572	3686	2486	2359	238
1979	4705	3683	4572	3683	2618	2359	292
1980	4705	3683	4572	3683	2751	2359	337
1981	4705	3683	4572	3683	2884	2359	377
1982	4705	3683	4572	3683	3017	2359	413

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	...
1972	32	48	80	14	67	81	12
1973	19	42	61	25	37	62	12
1974	...	...	...	...	...	...	...
1975	103	77	180	12	159	171	26
1976	...	...	...	...	...	...	...

FLORIDA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	3394	1712	5106	1629	3292	4921	8427
1971	4339	2074	6413	2443	3213	5656	9130
1972	4794	2044	6838	2838	3321	6159	9971
1973	4205	2424	6629	3726	2931	6657	9946
1974	4564	2469	7033	3418	2819	6237	10742
1975	6968	3196	10164	2604	3659	6263	14643
1976	6975	2268	9243	4048	2830	6878	17008

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	7174	9243	5744	9490	18438	16761	267
1978	7174	9243	5744	9244	19868	16760	377
1979	7174	9243	5744	9243	21298	16760	462
1980	7174	9243	5744	9243	22729	16760	533
1981	7174	9243	5744	9243	24159	16760	596
1982	7174	9243	5744	9243	25589	16760	653

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	190	15	205	84	103	187	371
1971	246	34	280	150	124	274	400
1972	300	54	354	166	138	304	411
1973	264	72	336	201	113	314	430
1974	326	86	412	235	130	365	475
1975	447	144	591	145	249	394	672
1976	431	68	499	214	172	386	785

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	352	499	283	528	854	756	62
1978	352	499	283	497	923	758	88
1979	352	499	283	499	992	758	108
1980	352	499	283	499	1061	758	124
1981	352	499	283	499	1130	758	139
1982	352	499	283	499	1199	758	152

GEORGIA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	6564
1972	4467	1455	5922	2732	1679	4411	7975
1973	4422	1407	5829	2736	3007	5743	8061
1974	4302	691	4993	2234	1879	4113	8941
1975	4986	753	5739	2268	2694	4962	9718
1976	4370	700	5070	1986	2422	4408	10689

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	5449	5070	4624	5349	11514	10409	198
1978	5449	5070	4624	5409	12339	10070	280
1979	5449	5070	4624	5070	13164	10070	342
1980	5449	5070	4624	5070	13989	10070	395
1981	5449	5070	4624	5070	14814	10070	442
1982	5449	5070	4624	5070	15639	10070	484

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	213
1972	129	40	169	82	50	132	250
1973	227	56	283	150	134	284	249
1974	234	44	278	95	84	179	348
1975	241	51	292	100	156	256	384
1976	253	13	266	107	108	215	445

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	274	266	228	256	491	454	46
1978	274	266	228	263	538	458	64
1979	274	266	228	266	584	458	79
1980	274	266	228	266	631	458	91
1981	274	266	228	266	677	458	102
1982	274	266	228	266	723	458	111

HAWAII

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	251
1972	100	92	192	97	52	149	294
1973	79	98	177	111	67	178	293
1974	86	133	219	127	78	205	307
1975	117	49	166	100	13	113	333
1976	77	44	121	110	16	126	328

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	149	121	134	157	343	292	31
1978	149	121	134	161	359	251	44
1979	149	121	134	121	374	251	53
1980	149	121	134	121	390	251	61
1981	149	121	134	121	405	251	69
1982	149	121	134	121	420	251	75

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	3
1972	3	4	7	1	3	4	6
1973	2	6	8	6	6	12	2
1974	1	1	2	1	1	2	2
1975	4	2	6	1	1	2	5
1976	3	2	5	0	0	0	10

IDAHO

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	361
1972	310	112	422	324	82	406	377
1973	357	108	465	373	51	424	418
1974	404	158	562	392	74	466	514
1975	503	108	611	460	85	545	580
1976	462	149	611	425	95	520	671

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	538	611	476	574	733	708	69
1978	538	611	476	615	795	704	97
1979	538	611	476	611	857	704	119
1980	538	611	476	611	919	704	138
1981	538	611	476	611	981	704	154
1982	538	611	476	611	1043	704	168

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	1
1972	15	7	22	8	15	23	0
1973	17	19	36	22	6	28	8
1974	13	10	23	17	3	20	11
1975	16	11	27	14	24	38	0
1976	27	21	48	19	18	37	11

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	42	48	40	34	13	25	20
1978	42	48	40	40	15	33	28
1979	42	48	40	48	17	33	34
1980	42	48	40	48	19	33	39
1981	42	48	40	48	21	33	43
1982	42	48	40	48	23	33	48

ILLINOIS

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	2278	472	2750	...	...	3741	6477
1971	2280	302	2582	...	...	3287	5742
1972	2455	295	2750	...	...	3022	5437
1973	2626	190	2816	...	...	2742	5215
1974	3251	299	3550	...	...	2782	6072
1975	4143	472	4615	...	...	3126	7215
1976	5270	802	6072	...	...	3378	9211

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	4444	6072	3112	4383	10543	10900	216
1978	4444	6072	3112	5755	11875	11217	306
1979	4444	6072	3112	6072	13207	11217	375
1980	4444	6072	3112	6072	14539	11217	432
1981	4444	6072	3112	6072	15871	11217	483
1982	4444	6072	3112	6072	17203	11217	530

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	64	3	67	...	...	79	125
1971	70	6	76	...	...	98	112
1972	95	11	106	...	...	78	116
1973	110	6	116	...	...	92	119
1974	121	6	127	...	...	83	100
1975	168	5	173	...	...	83	115
1976	222	4	226	...	...	213	199

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	171	226	144	165	226	260	42
1978	171	226	144	215	252	272	59
1979	171	226	144	226	279	272	73
1980	171	226	144	226	306	272	84
1981	171	226	144	226	332	272	94
1982	171	226	144	226	359	272	103

INDIANA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	4220
1972	...	...	...	...	...	...	3770
1973	806	312	1118	1052	530	1582	3306
1974	1659	1298	2957	1117	2135	3252	2990
1975	2163	313	2476	1246	436	1682	3784
1976	2059	237	2296	1800	229	2029	4051

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	2626	2296	2096	2475	4581	3872	133
1978	2626	2296	2096	2285	5112	3883	188
1979	2626	2296	2096	2296	5642	3883	231
1980	2626	2296	2096	2296	6173	3883	266
1981	2626	2296	2096	2296	6703	3883	297
1982	2626	2296	2096	2296	7234	3883	326

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	138
1972	...	...	...	...	...	...	77
1973	70	13	83	57	13	70	90
1974	84	33	117	97	31	128	61
1975	196	14	210	135	23	158	113
1976	133	15	148	87	22	109	152

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	132	148	87	222	197	78	34
1978	132	148	87	143	243	83	48
1979	132	148	87	148	288	83	59
1980	132	148	87	148	334	83	68
1981	132	148	87	148	379	83	76
1982	132	148	87	148	425	83	83

IOWA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	1496
1972	537	257	794	631	401	1032	1258
1973	574	171	745	351	302	653	1350
1974	629	195	824	431	329	760	1414
1975	813	231	1044	388	323	711	1747
1976	641	240	881	457	324	781	1815

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	838	881	698	963	1954	1733	83
1978	838	881	698	974	2093	1640	117
1979	838	881	698	881	2233	1640	143
1980	838	881	698	881	2372	1640	165
1981	838	881	698	881	2511	1640	184
1982	838	881	698	881	2650	1640	202

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	44
1972	52	34	86	32	50	82	48
1973	55	23	78	38	36	74	52
1974	41	18	59	28	21	49	62
1975	47	39	86	41	35	76	72
1976	46	29	75	38	32	70	76

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	80	75	73	70	83	81	25
1978	80	75	73	74	90	82	34
1979	80	75	73	75	97	82	42
1980	80	75	73	75	104	82	49
1981	80	75	73	75	111	82	54
1982	80	75	73	75	118	82	59

KANSAS

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	1950
1972	905	254	1159	877	445	1322	1586
1973	774	201	975	953	290	1243	1398
1974	904	283	1187	762	337	1099	1349
1975	1210	480	1690	637	685	1322	1682
1976	1227	488	1715	911	576	1487	2013

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	1345	1715	1110	1335	2248	2393	115
1978	1345	1715	1110	1625	2483	2483	163
1979	1345	1715	1110	1715	2718	2483	199
1980	1345	1715	1110	1715	2953	2483	230
1981	1345	1715	1110	1715	3188	2483	257
1982	1345	1715	1110	1715	3423	2483	282

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	67
1972	80	3	83	55	24	79	56
1973	53	4	57	58	13	71	44
1974	76	10	86	37	22	59	72
1975	101	33	134	60	56	116	56
1976	99	29	128	51	64	115	65

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	93	128	85	114	72	79	32
1978	93	128	85	135	79	71	45
1979	93	128	85	128	86	71	55
1980	93	128	85	128	93	71	63
1981	93	128	85	128	100	71	71
1982	93	128	85	128	107	71	77

KENTUCKY

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	1586	...	...	...	...
1971	...	...	1750	...	...	...	2969
1972	1640	1243	2883	1197	1803	3000	2852
1973	1628	1477	3105	1341	1868	3209	2748
1974	1724	475	2199	1665	440	2105	2939
1975	2008	480	2488	1868	290	2158	3269
1976	2239	521	2760	2093	261	2354	3521

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	2932	2760	2675	2300	3779	3980	146
1978	2932	2760	2675	2605	4036	4135	206
1979	2932	2760	2675	2760	4294	4135	253
1980	2932	2760	2675	2760	4552	4135	292
1981	2932	2760	2675	2760	4809	4135	326
1982	2932	2760	2675	2760	5067	4135	357

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	91
1972	89	20	109	70	41	111	89
1973	94	20	114	91	22	113	90
1974	137	20	157	113	29	142	112
1975	121	48	169	102	55	157	124
1976	143	11	154	124	25	149	136

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	134	154	119	145	151	144	35
1978	134	154	119	145	167	153	49
1979	134	154	119	154	182	153	60
1980	134	154	119	154	197	153	69
1981	134	154	119	154	213	153	77
1982	134	154	119	154	228	153	85

LOUISIANA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE COURT	OTHER	TOTAL	RELEASES PAROLE	OTHER	TOTAL	INMATES ON DECEMBER 31
1970	1563	236	1799	805	1053	1858	4108
1971	1538	302	1840	783	1190	1973	3975
1972	1554	310	1864	862	1310	2172	3667
1973	1823	289	2112	911	1377	2288	3491
1974	1942	336	2278	729	803	1532	4237
1975	2009	330	2339	705	932	1637	4939
1976	1995	285	2280	565	975	1540	5679

	ASSUMED INTAKE II	III	ASSUMED RELEASES II	III	PROJECTED COUNT II	III	ERROR
1977	2196	2280	1467	2290	6408	5668	133
1978	2196	2280	1467	2301	7138	5647	188
1979	2196	2280	1467	2280	7867	5647	230
1980	2196	2280	1467	2280	8596	5647	265
1981	2196	2280	1467	2280	9326	5647	296
1982	2196	2280	1467	2280	10055	5647	325

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE COURT	OTHER	TOTAL	RELEASES PAROLE	OTHER	TOTAL	INMATES ON DECEMBER 31
1970	71	12	83	64	28	92	125
1971	63	16	79	43	37	80	124
1972	51	19	70	48	44	92	102
1973	60	15	75	27	39	66	111
1974	99	8	107	29	33	62	156
1975	117	23	140	52	37	89	207
1976	104	25	129	50	53	103	233

	ASSUMED INTAKE II	III	ASSUMED RELEASES II	III	PROJECTED COUNT II	III	ERROR
1977	102	129	61	135	274	226	32
1978	102	129	61	138	314	218	45
1979	102	129	61	129	355	218	55
1980	102	129	61	129	396	218	63
1981	102	129	61	129	436	218	71
1982	102	129	61	129	477	218	78

MAINE

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	442	...
1971	...	...	...	...	...	...	...
1972	...	...	869	419	434	853	458
1973	459	378	837	433	423	856	439
1974	529	156	685	471	144	615	509
1975	631	155	786	573	94	667	628
1976	528	199	727	668	87	755	600

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	782	727	728	751	654	575	75
1978	782	727	728	771	707	531	106
1979	782	727	728	727	761	531	130
1980	782	727	728	727	815	531	150
1981	782	727	728	727	868	531	168
1982	782	727	728	727	922	531	184

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	12
1972	17	10	27	16	8	24	15
1973	15	11	26	16	11	27	14
1974	25	6	31	23	4	27	18
1975	20	4	24	22	5	27	15
1976	20	2	22	24	3	27	10

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	24	22	25	23	9	10	14
1978	24	22	25	21	7	10	19
1979	24	22	25	22	6	10	23
1980	24	22	25	22	5	10	27
1981	24	22	25	22	3	10	30
1982	24	22	25	22	2	10	32

MARYLAND

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	4753	412	5165	2539	2282	4821	5063
1971	4078	327	4405	1990	2871	4861	4861
1972	4021	751	4772	2274	1926	4200	5433
1973	4270	644	4914	3168	1320	4488	5697
1974	4048	760	4808	3007	1325	4332	6084
1975	4449	791	5240	3070	1500	4570	6754
1976	4589	748	5337	2617	1795	4412	7679

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	4871	5337	4307	4993	8243	8022	203
1978	4871	5337	4307	5250	8806	8109	287
1979	4871	5337	4307	5337	9370	8109	351
1980	4871	5337	4307	5337	9933	8109	405
1981	4871	5337	4307	5337	10497	8109	453
1982	4871	5337	4307	5337	11061	8109	497

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	190	29	219	130	91	221	123
1971	159	26	185	112	79	191	80
1972	186	29	215	96	63	159	145
1973	138	16	154	117	28	145	162
1974	212	16	228	181	53	234	163
1975	296	18	314	197	69	266	211
1976	296	21	317	196	99	295	233

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	251	317	220	275	264	274	50
1978	251	317	220	318	294	273	70
1979	251	317	220	317	325	273	86
1980	251	317	220	317	355	273	99
1981	251	317	220	317	386	273	111
1982	251	317	220	317	417	273	121

MASSACHUSETTS

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	727	679	1406	694	593	1287	2270
1971	947	671	1618	872	579	1451	2319
1972	1019	789	1808	1280	763	2043	2018
1973	1033	797	1830	891	515	1406	2021
1974	784	708	1492	786	717	1503	2057
1975	940	980	1920	625	689	1314	2270
1976	1236	714	1950	735	748	1483	2696

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	1879	1950	1709	1631	2865	3015	123
1978	1879	1950	1709	1823	3035	3141	174
1979	1879	1950	1709	1950	3204	3141	213
1980	1879	1950	1709	1950	3374	3141	245
1981	1879	1950	1709	1950	3543	3141	274
1982	1879	1950	1709	1950	3713	3141	300

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	134	75	209	65	105	170	120
1971	144	115	259	77	200	277	137
1972	84	207	291	84	243	327	•••
1973	48	111	159	98	103	201	•••
1974	82	54	136	49	73	122	•••
1975	122	85	207	80	122	202	•••
1976	142	86	228	69	124	193	•••

MICHIGAN

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	9261
1972	4082	9153	13235	4666	9601	14267	8259
1973	3159	9563	12722	3912	9386	13298	7683
1974	3709	3216	6925	3543	2655	6198	8410
1975	4534	1683	6217	3156	937	4093	10534
1976	4715	1622	6337	3684	1130	4814	12057

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	9529	6337	8071	5788	13515	12606	221
1978	9529	6337	8071	6302	14973	12641	313
1979	9529	6337	8071	6337	16431	12641	383
1980	9529	6337	8071	6337	17889	12641	442
1981	9529	6337	8071	6337	19347	12641	494
1982	9529	6337	8071	6337	20805	12641	541

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	256
1972	174	305	479	159	364	523	212
1973	147	476	623	158	486	644	191
1974	186	279	465	148	288	436	220
1975	235	138	373	123	152	275	318
1976	259	149	408	171	150	321	405

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	515	408	444	368	476	465	56
1978	515	408	444	391	548	481	80
1979	515	408	444	408	619	481	97
1980	515	408	444	408	690	481	112
1981	515	408	444	408	762	481	126
1982	515	408	444	408	833	481	138

MINNESOTA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	1493
1972	820	219	1039	1033	212	1245	1287
1973	802	122	924	767	99	866	1345
1974	712	282	994	873	135	1008	1331
1975	748	360	1108	579	235	814	1625
1976	753	349	1102	808	352	1160	1561

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	1070	1102	1002	1063	1629	1599	93
1978	1070	1102	1002	1103	1698	1598	131
1979	1070	1102	1002	1102	1766	1598	160
1980	1070	1102	1002	1102	1835	1598	185
1981	1070	1102	1002	1102	1903	1598	206
1982	1070	1102	1002	1102	1972	1598	226

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	60
1972	36	26	62	52	20	72	50
1973	39	16	55	41	7	48	57
1974	39	25	64	52	28	80	41
1975	46	35	81	46	26	72	50
1976	43	31	74	41	36	77	63

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	68	74	65	73	66	64	24
1978	68	74	65	76	69	62	34
1979	68	74	65	74	73	62	42
1980	68	74	65	74	76	62	48
1981	68	74	65	74	79	62	54
1982	68	74	65	74	83	62	59

MISSISSIPPI

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	614	610	1224	383	761	1144	1656
1971	...	...	...	...	...	...	...
1972	761	675	1436	391	996	1387	1845
1973	919	695	1614	515	1060	1575	1877
1974	1081	735	1816	727	1087	1814	1880
1975	1165	985	2150	530	1310	1840	2170
1976	...	...	2490	538	1699	2237	2509

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	1963	2490	1797	2318	2675	2681	139
1978	1963	2490	1797	2432	2841	2738	196
1979	1963	2490	1797	2490	3007	2738	240
1980	1963	2490	1797	2490	3173	2738	277
1981	1963	2490	1797	2490	3339	2738	310
1982	1963	2490	1797	2490	3505	2738	339

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	23	...	...	...	...	...	48
1971	...	...	...	...	...	...	...
1972	40	...	...	...	...	...	60
1973	39	...	...	...	...	...	67
1974	37	...	...	...	...	...	66
1975	57	...	...	...	...	...	86
1976	...	...	...	...	...	...	...

MISSOURI

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	3515
1972	1543	172	1715	799	984	1783	3447
1973	1712	272	1984	751	998	1749	3682
1974	1911	281	2192	781	1030	1811	3660
1975	2135	290	2425	869	941	1810	4275
1976	2324	279	2603	1026	974	2000	4878

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	2159	2603	1801	2215	5236	5266	142
1978	2159	2603	1801	2446	5593	5422	200
1979	2159	2603	1801	2603	5951	5422	245
1980	2159	2603	1801	2603	6309	5422	283
1981	2159	2603	1801	2603	6667	5422	317
1982	2159	2603	1801	2603	7024	5422	347

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	99
1972	58	9	67	28	52	80	86
1973	59	5	64	33	32	65	85
1974	87	10	97	42	32	74	108
1975	92	31	123	39	92	131	96
1976	95	24	119	61	35	96	119

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	93	119	85	111	127	127	31
1978	93	119	85	120	135	127	43
1979	93	119	85	119	144	127	53
1980	93	119	85	119	152	127	61
1981	93	119	85	119	160	127	68
1982	93	119	85	119	168	127	75

MONTANA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	222	129	351	305	153	458	260
1971	248	104	352	247	117	364	248
1972	269	107	376	259	87	346	278
1973	249	117	366	235	93	328	316
1974	260	69	329	259	50	309	336
1975	281	131	412	264	109	373	375
1976	304	162	466	277	67	344	551

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	409	466	348	372	612	645	60
1978	409	466	348	426	672	684	85
1979	409	466	348	466	733	684	104
1980	409	466	348	466	793	684	120
1981	409	466	348	466	854	684	134
1982	409	466	348	466	915	684	147

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	6	6	12	7	14	21	...
1971	7	8	15	4	10	14	2
1972	13	11	24	9	12	21	5
1973	8	6	14	8	6	14	5
1974	10	7	17	6	11	17	0
1975	10	26	36	12	24	36	0
1976	8	5	13	8	5	13	0

NEBRASKA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	625	...	...	580	957
1971	...	...	642	...	...	584	991
1972	479	98	577	566	109	675	892
1973	517	141	658	529	61	590	951
1974	462	198	660	545	48	593	989
1975	662	174	836	444	212	656	1184
1976	672	164	836	430	228	658	1336

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	706	836	595	716	1447	1456	81
1978	706	836	595	831	1558	1461	114
1979	706	836	595	836	1669	1461	139
1980	706	836	595	836	1780	1461	161
1981	706	836	595	836	1891	1461	180
1982	706	836	595	836	2002	1461	197

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	49
1972	55	50	105	38	55	93	61
1973	37	30	67	45	28	73	55
1974	30	30	60	27	37	64	51
1975	34	31	65	32	17	49	67
1976	51	30	81	41	22	63	85

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	93	81	87	63	91	103	25
1978	93	81	87	73	97	111	36
1979	93	81	87	81	103	111	44
1980	93	81	87	81	109	111	50
1981	93	81	87	81	115	111	56
1982	93	81	87	81	121	111	62

NEVADA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	306	...	...	291	659
1971	259	10	269	215	109	324	604
1972	247	113	360	214	134	348	616
1973	311	55	366	163	105	268	714
1974	263	67	330	200	133	333	766
1975	387	77	464	363	99	462	768
1976	395	99	494	291	108	399	899

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	381	494	322	390	958	1003	62
1978	381	494	322	475	1017	1021	88
1979	381	494	322	494	1076	1021	107
1980	381	494	322	494	1135	1021	124
1981	381	494	322	494	1194	1021	138
1982	381	494	322	494	1253	1021	151

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	12	...	...	4	29
1971	11	0	11	6	3	9	31
1972	17	2	19	15	5	20	30
1973	11	8	19	8	7	15	34
1974	17	11	28	11	13	24	35
1975	21	28	49	29	9	38	46
1976	26	32	58	18	30	48	54

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	34	58	30	45	59	66	22
1978	34	58	30	53	63	71	30
1979	34	58	30	58	68	71	37
1980	34	58	30	58	72	71	43
1981	34	58	30	58	77	71	48
1982	34	58	30	58	82	71	52

NEW HAMPSHIRE

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	210
1972	189	217	406	205	174	379	237
1973	201	132	333	199	94	293	277
1974	169	78	247	217	88	305	219
1975	192	169	361	189	93	282	250
1976	170	93	263	172	7	179	255

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	298	263	289	296	264	221	45
1978	298	263	289	274	273	210	64
1979	298	263	289	263	282	210	78
1980	298	263	289	263	291	210	90
1981	298	263	289	263	300	210	101
1982	298	263	289	263	309	210	111

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	3	...	...	3
1972	3	0	3	3	0	3	3
1973	5	0	5	3	5	8	0
1974	5	9	14	9	5	14	0
1975	4	1	5	3	0	3	0
1976	2	0	2	2	0	2	0

NEW JERSEY

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE COURT	INTAKE OTHER	INTAKE TOTAL	RELEASES PAROLE	RELEASES OTHER	RELEASES TOTAL	INMATES ON DECEMBER 31
1970	2093	1285	3378	2396	722	3118	4681
1971	2578	1383	3961	3239	676	3915	4707
1972	3438	1106	4544	3676	831	4507	4667
1973	3181	890	4071	3380	580	3960	4976
1974	2326	1547	3873	3291	717	4008	4721
1975	2470	1701	4171	2935	802	3737	5052
1976	2549	1354	3903	3110	576	3686	5651

	ASSUMED INTAKE II	ASSUMED INTAKE III	ASSUMED RELEASES II	ASSUMED RELEASES III	PROJECTED COUNT II	PROJECTED COUNT III	ERROR
1977	4223	3903	3977	4008	5897	5546	174
1978	4223	3903	3977	3991	6143	5457	245
1979	4223	3903	3977	3903	6389	5457	300
1980	4223	3903	3977	3903	6635	5457	347
1981	4223	3903	3977	3903	6881	5457	388
1982	4223	3903	3977	3903	7127	5457	425

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE COURT	INTAKE OTHER	INTAKE TOTAL	RELEASES PAROLE	RELEASES OTHER	RELEASES TOTAL	INMATES ON DECEMBER 31
1970	151	71	222	99	51	150	235
1971	177	48	225	219	23	242	218
1972	164	48	212	193	49	242	188
1973	176	58	234	221	46	267	155
1974	106	95	201	156	48	204	152
1975	160	75	235	152	54	206	181
1976	147	59	206	127	45	172	215

	ASSUMED INTAKE II	ASSUMED INTAKE III	ASSUMED RELEASES II	ASSUMED RELEASES III	PROJECTED COUNT II	PROJECTED COUNT III	ERROR
1977	209	206	202	206	222	214	40
1978	209	206	202	218	228	202	57
1979	209	206	202	206	235	202	69
1980	209	206	202	206	242	202	80
1981	209	206	202	206	249	202	89
1982	209	206	202	206	255	202	98

NEW MEXICO

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE COURT	INTAKE OTHER	INTAKE TOTAL	RELEASES PAROLE	RELEASES OTHER	RELEASES TOTAL	INMATES ON DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	632
1972	416	202	618	452	223	675	575
1973	485	147	632	413	92	505	702
1974	426	184	610	355	84	439	873
1975	492	239	731	511	126	637	967
1976	553	288	841	505	136	641	1167

	ASSUMED INTAKE II	ASSUMED INTAKE III	ASSUMED RELEASES II	ASSUMED RELEASES III	PROJECTED COUNT II	PROJECTED COUNT III	ERROR
1977	729	841	581	676	1315	1331	81
1978	729	841	581	784	1463	1388	114
1979	729	841	581	841	1611	1388	140
1980	729	841	581	841	1759	1388	161
1981	729	841	581	841	1907	1388	180
1982	729	841	581	841	2055	1388	197

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE COURT	INTAKE OTHER	INTAKE TOTAL	RELEASES PAROLE	RELEASES OTHER	RELEASES TOTAL	INMATES ON DECEMBER 31
1970	13	4	17	8	13	21	18
1971	7	5	12	13	11	24	10
1972	25	8	33	9	12	21	22
1973	22	3	25	17	6	23	24
1974	20	5	25	16	4	20	29
1975	24	6	30	24	3	27	30
1976	28	20	48	19	8	27	53

	ASSUMED INTAKE II	ASSUMED INTAKE III	ASSUMED RELEASES II	ASSUMED RELEASES III	PROJECTED COUNT II	PROJECTED COUNT III	ERROR
1977	48	48	33	34	61	67	20
1978	48	48	33	42	68	73	28
1979	48	48	33	48	76	73	34
1980	48	48	33	48	84	73	39
1981	48	48	33	48	92	73	43
1982	48	48	33	48	99	73	48

NEW YORK

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	3721	2601	6322	5460	1246	6706	11748
1971	4439	2219	6658	5670	1111	6781	11613
1972	5047	1880	6927	5700	1200	6900	11346
1973	5743	1817	7560	5422	882	6304	12530
1974	5906	2134	8040	5441	1384	6825	13969
1975	6644	2122	8766	5932	1141	7073	15662
1976	7146	2272	9418	6663	1164	7827	17233

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	8172	9418	6701	8564	18705	18086	269
1978	8172	9418	6701	9153	20176	18351	381
1979	8172	9418	6701	9418	21648	18351	466
1980	8172	9418	6701	9418	23120	18351	538
1981	8172	9418	6701	9418	24592	18351	602
1982	8172	9418	6701	9418	26063	18351	659

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	151	70	221	195	44	239	311
1971	183	64	247	203	36	239	315
1972	215	44	259	185	36	221	347
1973	212	34	246	223	26	249	346
1974	225	33	258	202	25	227	380
1975	264	37	301	219	33	252	429
1976	275	44	319	234	42	276	472

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	289	319	258	290	503	500	50
1978	289	319	258	314	534	505	71
1979	289	319	258	319	566	505	86
1980	289	319	258	319	597	505	100
1981	289	319	258	319	628	505	111
1982	289	319	258	319	659	505	122

NORTH CAROLINA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	7839
1972	2908	1345	4253	2243	1563	3806	7966
1973	3094	1497	4591	1567	1678	3245	9242
1974	5119	2493	7612	3446	3574	7020	10546
1975	5915	2067	7982	4198	3333	7531	10997
1976	6471	1839	8310	4330	3384	7714	11195

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	6475	8310	5674	7994	11926	11511	253
1978	6475	8310	5674	8451	12657	11370	358
1979	6475	8310	5674	8310	13389	11370	438
1980	6475	8310	5674	8310	14120	11370	506
1981	6475	8310	5674	8310	14851	11370	566
1982	6475	8310	5674	8310	15582	11370	619

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	256
1972	164	34	198	139	38	177	277
1973	178	28	206	100	53	153	330
1974	257	50	307	185	96	281	356
1975	304	56	360	193	101	294	452
1976	304	53	357	254	116	370	375

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	281	357	258	354	399	378	53
1978	281	357	258	360	423	375	75
1979	281	357	258	357	446	375	91
1980	281	357	258	357	470	375	105
1981	281	357	258	357	494	375	118
1982	281	357	258	357	518	375	129

NORTH DAKOTA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	132
1972	187	27	214	86	81	167	179
1973	193	32	225	129	101	230	174
1974	112	44	156	136	46	182	129
1975	142	30	172	88	40	128	173
1976	105	64	169	128	52	180	162

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	163	169	146	188	178	143	37
1978	163	169	146	181	195	131	51
1979	163	169	146	169	211	131	63
1980	163	169	146	169	228	131	73
1981	163	169	146	169	244	131	81
1982	163	169	146	169	261	131	89

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	0
1972	0	0	0	0	0	0	0
1973	0	0	0	0	0	0	0
1974	1	2	3	2	1	3	0
1975	2	0	2	1	1	2	0
1976	4	0	4	0	4	4	0

OHIO

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	3928	0	3928	4570	287	4857	9305
1971	4096	0	4096	4647	231	4878	8789
1972	4605	407	5012	5491	296	5787	8014
1973	4635	537	5172	5283	454	5737	7449
1974	5843	664	6507	4643	334	4977	8978
1975	7014	481	7495	5239	249	5488	10985
1976	4397	2637	7034	5588	448	6036	11983

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	6103	7034	4592	7232	13494	11785	233
1978	6103	7034	4592	7115	15006	11704	329
1979	6103	7034	4592	7034	16517	11704	403
1980	6103	7034	4592	7034	18028	11704	465
1981	6103	7034	4592	7034	19540	11704	520
1982	6103	7034	4592	7034	21051	11704	570

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	168	0	168	194	20	214	300
1971	208	0	208	227	11	238	274
1972	236	12	248	250	10	260	262
1973	253	22	275	246	23	269	268
1974	367	40	407	301	26	327	348
1975	442	25	467	369	10	379	436
1976	335	194	529	400	23	423	542

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	402	529	311	456	633	615	64
1978	402	529	311	518	725	627	91
1979	402	529	311	529	816	627	111
1980	402	529	311	529	907	627	128
1981	402	529	311	529	999	627	143
1982	402	529	311	529	1090	627	157

OKLAHOMA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	3486
1972	1860	1088	2948	747	2260	3007	3547
1973	1814	196	2010	761	1713	2474	3083
1974	1837	126	1963	1077	1156	2233	2813
1975	2117	366	2483	993	1320	2313	2983
1976	1887	318	2205	774	911	1685	3276

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	2084	2205	1852	2193	3507	3288	131
1978	2084	2205	1852	2309	3739	3184	185
1979	2084	2205	1852	2205	3970	3184	226
1980	2084	2205	1852	2205	4202	3184	261
1981	2084	2205	1852	2205	4433	3184	292
1982	2084	2205	1852	2205	4665	3184	319

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	123
1972	103	6	109	62	50	112	120
1973	109	1	110	53	73	126	104
1974	87	6	93	61	53	114	83
1975	135	7	142	41	34	75	150
1976	123	11	134	90	48	138	141

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	113	134	84	119	170	156	33
1978	113	134	84	139	199	151	46
1979	113	134	84	134	228	151	56
1980	113	134	84	134	257	151	65
1981	113	134	84	134	286	151	72
1982	113	134	84	134	315	151	79

OREGON

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	866	3727	4593	429	4109	4538	1788
1971	969	...	...	402	...	...	1909
1972	858	7441	8299	599	7855	8454	1717
1973	812	6727	7539	700	7005	7705	1574
1974	1021	393	1414	616	486	1102	1868
1975	1270	390	1660	668	520	1188	2343
1976	1339	388	1727	903	460	1363	2702

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	4633	1727	4257	1566	3078	2863	116
1978	4633	1727	4257	1723	3454	2867	163
1979	4633	1727	4257	1727	3830	2867	200
1980	4633	1727	4257	1727	4206	2867	231
1981	4633	1727	4257	1727	4582	2867	258
1982	4633	1727	4257	1727	4958	2867	283

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	46	317	363	20	332	352	80
1971	60	...	...	21	...	...	79
1972	47	395	442	33	414	447	74
1973	52	225	277	49	248	297	54
1974	63	22	85	34	25	59	76
1975	67	18	85	45	25	70	81
1976	75	15	90	46	29	75	102

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	183	90	167	86	118	106	27
1978	183	90	167	90	134	106	38
1979	183	90	167	90	150	106	46
1980	183	90	167	90	166	106	53
1981	183	90	167	90	182	106	59
1982	183	90	167	90	198	106	[illegible]

PENNSYLVANIA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	6289
1971	2559	794	3353	3159	857	4016	6276
1972	2844	957	3801	2893	1040	3933	5984
1973	3237	1044	4281	2897	950	3847	6198
1974	3149	1120	4269	3285	739	4024	6887
1975	3392	1336	4728	3195	934	4129	7310
1976	3240	1208	4448	3314	836	4150	7747

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	4124	4448	3684	4447	8188	7747	185
1978	4124	4448	3684	4564	8628	7631	262
1979	4124	4448	3684	4448	9069	7631	321
1980	4124	4448	3684	4448	9510	7631	370
1981	4124	4448	3684	4448	9951	7631	414
1982	4124	4448	3684	4448	10391	7631	453

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	81	5	86	95	31	126	177
1972	106	16	122	61	29	90	245
1973	128	14	142	106	29	135	192
1974	131	22	153	113	34	147	289
1975	166	30	196	113	27	140	249
1976	173	25	198	150	29	179	266

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	160	198	155	168	271	295	40
1978	160	198	155	193	276	300	56
1979	160	198	155	198	282	300	68
1980	160	198	155	198	287	300	79
1981	160	198	155	198	292	300	88
1982	160	198	155	198	297	300	96

RHODE ISLAND

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	372
1972	237	81	318	139	217	356	334
1973	...	...	...	...	...	...	397
1974	148	32	180	126	8	134	427
1975	219	8	227	226	57	283	371
1976	216	87	303	149	69	218	483

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	318	303	273	260	520	526	49
1978	318	303	273	305	557	524	69
1979	318	303	273	303	595	524	84
1980	318	303	273	303	632	524	97
1981	318	303	273	303	669	524	108
1982	318	303	273	303	706	524	119

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	6
1972	3	0	3	3	0	3	6
1973	...	...	...	...	...	...	7
1974	2	5	7	6	0	6	8
1975	1	1	2	8	0	8	10
1976	6	2	8	6	3	9	9

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	6	8	5	7	10	15	8
1978	6	8	5	8	10	15	12
1979	6	8	5	8	11	15	14
1980	6	8	5	8	12	15	16
1981	6	8	5	8	13	15	18
1982	6	8	5	8	13	15	20

SOUTH CAROLINA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	1610	356	1966	381	1360	1741	2711
1971	1968	190	2158	565	1329	1894	2931
1972	2061	235	2296	772	1406	2178	3049
1973	2533	452	2985	1092	1598	2690	3344
1974	2493	1192	3685	1007	1854	2861	4168
1975	3732	638	4370	622	2525	3147	5391
1976	3246	547	3793	1745	1270	3015	6169

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	2879	3793	2303	3474	6745	6488	171
1978	2879	3793	2303	3941	7322	6340	242
1979	2879	3793	2303	3793	7898	6340	296
1980	2879	3793	2303	3793	8474	6340	342
1981	2879	3793	2303	3793	9051	6340	382
1982	2879	3793	2303	3793	9627	6340	419

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	71	22	93	26	72	98	96
1971	113	24	137	21	76	97	135
1972	151	10	161	36	112	148	148
1973	90	23	113	44	72	116	145
1974	93	25	118	46	67	113	150
1975	60	113	173	43	71	114	[illegible]
1976	151	23	174	74	45	119	[illegible]

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	133	174	105	106	292	332	37
1978	133	174	105	129	320	376	52
1979	133	174	105	174	348	376	64
1980	133	174	105	174	376	376	74
1981	133	174	105	174	404	376	82
1982	133	174	105	174	432	376	90

SOUTH DAKOTA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	380
1972	226	64	290	128	207	335	335
1973	190	65	255	149	208	357	233
1974	239	87	326	160	154	314	245
1975	284	74	358	177	106	283	320
1976	280	107	387	154	92	246	461

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	321	387	245	309	537	539	55
1978	321	387	245	356	613	570	78
1979	321	387	245	387	689	570	95
1980	321	387	245	387	765	570	110
1981	321	387	245	387	841	570	122
1982	321	387	245	387	917	570	134

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	8
1972	10	1	11	9	1	10	9
1973	2	0	2	4	4	8	3
1974	5	4	9	2	5	7	5
1975	12	5	17	1	3	4	18
1976	20	3	23	18	3	21	20

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	13	23	7	4	26	39	14
1978	13	23	7	10	31	52	19
1979	13	23	7	23	37	52	24
1980	13	23	7	23	43	52	27
1981	13	23	7	23	48	52	30
1982	13	23	7	23	54	52	33

TENNESSEE

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	3340
1972	1491	3801	5332	930	4511	5441	3231
1973	1459	2901	4360	904	3365	4269	3322
1974	1792	335	2127	1245	573	1818	3631
1975	2353	499	2852	1513	599	2112	4371
1976	2482	506	2988	2184	552	2736	4623

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	4160	2988	3812	2479	4971	5131	152
1978	4160	2988	3812	2895	5319	5224	215
1979	4160	2988	3812	2988	5667	5224	263
1980	4160	2988	3812	2988	6015	5224	304
1981	4160	2988	3812	2988	6363	5224	339
1982	4160	2988	3812	2988	6711	5224	372

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	114
1972	72	67	139	54	101	155	98
1973	67	58	125	41	50	91	32
1974	103	20	123	63	52	115	140
1975	141	40	181	79	52	131	190
1976	176	41	217	150	63	213	194

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	178	217	154	157	218	254	41
1978	178	217	154	196	242	274	58
1979	178	217	154	217	266	274	71
1980	178	217	154	217	290	274	82
1981	178	217	154	217	314	274	92
1982	178	217	154	217	338	274	101

TEXAS

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE COURT	OTHER	TOTAL	RELEASES PAROLE	OTHER	TOTAL	INMATES ON DECEMBER 31
1970	6725	2198	8923	3655	5247	8902	15487
1971	7152	2187	9339	3929	5481	9410	15386
1972	6555	2171	8726	3805	5161	8966	15146
1973	7218	2496	9714	3328	4911	8239	16621
1974	6989	2465	9454	4518	5346	9864	16211
1975	8692	846	9538	4360	3044	7404	18345
1976	9089	1118	10207	4798	3744	8542	19894

	ASSUMED INTAKE II	III	ASSUMED RELEASES II	III	PROJECTED COUNT II	III	ERROR
1977	9466	10207	8279	8661	21081	21439	281
1978	9466	10207	8279	9877	22268	21769	397
1979	9466	10207	8279	10207	23455	21769	486
1980	9466	10207	8279	10207	24642	21769	561
1981	9466	10207	8279	10207	25829	21769	627
1982	9466	10207	8279	10207	27016	21769	686

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE COURT	OTHER	TOTAL	RELEASES PAROLE	OTHER	TOTAL	INMATES ON DECEMBER 31
1970	311	94	405	179	233	412	575
1971	318	111	429	184	217	401	603
1972	326	111	437	216	261	477	563
1973	363	89	452	161	237	398	617
1974	399	131	530	278	247	525	622
1975	508	34	542	314	142	456	708
1976	570	77	647	376	156	532	823

	ASSUMED INTAKE II	III	ASSUMED RELEASES II	III	PROJECTED COUNT II	III	ERROR
1977	542	647	477	519	888	951	71
1978	542	647	477	611	953	986	100
1979	542	647	477	647	1018	986	123
1980	542	647	477	647	1083	986	142
1981	542	647	477	647	1148	986	158
1982	542	647	477	647	1213	986	173

UTAH

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	196	83	279	217	60	277	491
1971	192	84	276	117	59	176	592
1972	159	84	243	184	61	245	588
1973	145	125	270	229	72	301	555
1974	155	288	443	206	216	422	591
1975	238	307	545	203	182	385	723
1976	233	432	665	200	294	494	827

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	472	665	416	604	883	888	72
1978	472	665	416	646	939	907	102
1979	472	665	416	665	995	907	124
1980	472	665	416	665	1051	907	143
1981	472	665	416	665	1107	907	160
1982	472	665	416	665	1163	907	176

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	8	2	10	7	2	9	16
1971	2	4	6	4	1	5	16
1972	10	1	11	12	1	13	15
1973	6	2	8	9	1	10	13
1974	12	18	30	8	6	14	16
1975	13	25	38	9	21	30	23
1976	15	21	36	14	20	34	25

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	23	36	21	33	26	28	17
1978	23	36	21	35	28	29	24
1979	23	36	21	36	29	29	29
1980	23	36	21	36	31	29	34
1981	23	36	21	36	33	29	38
1982	23	36	21	36	34	29	41

VERMONT

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	215
1972	...	...	205	...	...	197	223
1973	150	43	193	126	29	155	218
1974	166	73	239	107	75	182	238
1975	149	50	199	114	84	198	239
1976	187	102	289	146	81	227	301

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	241	289	222	235	320	355	48
1978	241	289	222	258	339	386	67
1979	241	289	222	289	359	386	82
1980	241	289	222	289	378	386	95
1981	241	289	222	289	397	386	106
1982	241	289	222	289	416	386	116

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	7
1972	...	...	21	...	...	21	7
1973	5	8	13	2	8	10	10
1974	5	4	9	9	3	12	4
1975	6	1	7	6	0	6	5
1976	8	4	12	5	6	11	6

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	13	12	13	10	6	8	10
1978	13	12	13	11	6	8	14
1979	13	12	13	12	5	8	17
1980	13	12	13	12	5	8	20
1981	13	12	13	12	5	8	22
1982	13	12	13	12	5	8	24

VIRGINIA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	1777	1031	2808	719	1762	2481	4449
1971	1917	1067	2984	717	1959	2676	4757
1972	2203	2255	4458	1423	3071	4494	4784
1973	2143	2303	4446	1502	2798	4300	4930
1974	1934	2004	3938	1049	2950	3999	4869
1975	2263	853	3116	1374	1320	2694	5291
1976	2983	646	3629	1744	1220	2964	5956

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	3218	3629	2967	2729	6207	6855	167
1978	3218	3629	2967	3312	6458	7172	237
1979	3218	3629	2967	3629	6709	7172	290
1980	3218	3629	2967	3629	6961	7172	334
1981	3218	3629	2967	3629	7212	7172	374
1982	3218	3629	2967	3629	7463	7172	410

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	73	41	114	34	82	116	119
1971	104	54	158	31	91	122	155
1972	117	124	241	50	190	240	162
1973	119	130	249	78	163	241	170
1974	94	119	213	55	165	220	163
1975	144	21	165	61	61	122	206
1976	165	25	190	107	65	172	224

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	152	190	134	142	241	272	39
1978	152	190	134	180	259	282	55
1979	152	190	134	190	276	282	67
1980	152	190	134	190	294	282	77
1981	152	190	134	190	311	282	86
1982	152	190	134	190	329	282	[illegible]

WASHINGTON

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	2643
1972	1097	591	1688	1611	280	1891	2460
1973	1155	491	1646	1355	267	1622	2484
1974	1115	1043	2158	1213	588	1801	2841
1975	1297	660	1957	1321	204	1525	3273
1976	1319	697	2016	1399	154	1553	3672

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	1852	2016	1549	1707	3975	3981	125
1978	1852	2016	1549	1928	4278	4069	177
1979	1852	2016	1549	2016	4581	4069	216
1980	1852	2016	1549	2016	4884	4069	249
1981	1852	2016	1549	2016	5187	4069	279
1982	1852	2016	1549	2016	5490	4069	305

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	119
1972	80	55	135	71	35	106	148
1973	80	53	133	89	44	133	148
1974	69	65	134	79	55	134	148
1975	116	28	144	90	23	113	179
1976	123	51	174	93	32	125	209

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	154	174	139	101	224	282	37
1978	154	174	139	157	239	299	52
1979	154	174	139	174	255	299	64
1980	154	174	139	174	270	299	76
1981	154	174	139	174	285	299	82
1982	154	174	139	174	300	299	90

WEST VIRGINIA

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	969
1971	...	...	952	...	...	891	1030
1972	...	...	1091	...	...	1096	1025
1973	...	...	871	...	...	851	1045
1974	...	...	842	...	...	901	986
1975	...	...	1181	...	...	925	1242
1976	...	...	965	...	...	951	1256

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	1028	965	980	1011	1304	1209	87
1978	1028	965	980	1073	1352	1101	122
1979	1028	965	980	965	1399	1101	150
1980	1028	965	980	965	1447	1101	173
1981	1028	965	980	965	1495	1101	193
1982	1028	965	980	965	1543	1101	211

147

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	DECEMBER 31
1970	...	...	...	...	...	...	21
1971	...	...	19	...	...	7	33
1972	...	...	14	...	...	14	33
1973	...	...	22	...	...	14	41
1974	...	...	17	...	...	17	41
1975	...	...	17	...	...	19	39
1976	...	...	17	...	...	17	39

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	15	17	13	17	42	39	12
1978	15	17	13	17	45	39	17
1979	15	17	13	17	48	39	20
1980	15	17	13	17	51	39	23
1981	15	17	13	17	54	39	26
1982	15	17	13	17	57	39	28

WISCONSIN

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE COURT	INTAKE OTHER	INTAKE TOTAL	RELEASES PAROLE	RELEASES OTHER	RELEASES TOTAL	INMATES ON DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	2384
1972	754	503	1257	1371	308	1679	1962
1973	960	411	1371	934	328	1262	2071
1974	1131	449	1580	874	276	1150	2501
1975	1339	366	1705	1067	272	1339	2867
1976	1384	465	1849	1260	296	1556	3160

	ASSUMED INTAKE II	ASSUMED INTAKE III	ASSUMED RELEASES II	ASSUMED RELEASES III	PROJECTED COUNT II	PROJECTED COUNT III	ERROR
1977	1553	1849	1253	1740	3459	3269	120
1978	1553	1849	1253	1833	3759	3285	169
1979	1553	1849	1253	1849	4058	3285	207
1980	1553	1849	1253	1849	4358	3285	239
1981	1553	1849	1253	1849	4657	3285	267
1982	1553	1849	1253	1849	4957	3285	292

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE COURT	INTAKE OTHER	INTAKE TOTAL	RELEASES PAROLE	RELEASES OTHER	RELEASES TOTAL	INMATES ON DECEMBER 31
1970	...	...	...	...	...	...	...
1971	...	...	...	...	...	...	109
1972	68	17	85	101	19	120	74
1973	76	16	92	71	20	91	75
1974	66	12	78	49	19	68	86
1975	104	12	116	62	15	77	125
1976	90	20	110	66	30	96	139

	ASSUMED INTAKE II	ASSUMED INTAKE III	ASSUMED RELEASES II	ASSUMED RELEASES III	PROJECTED COUNT II	PROJECTED COUNT III	ERROR
1977	98	110	81	114	155	135	33
1978	98	110	81	114	171	130	42
1979	98	110	81	110	188	130	51
1980	98	110	81	110	204	130	59
1981	98	110	81	110	220	130	66
1982	98	110	81	110	236	130	72

WYOMING

MALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	217
1971	172	1	173	10	135	145	257
1972	135	10	145	9	141	150	253
1973	145	9	154	13	128	141	278
1974	120	2	122	9	126	135	269
1975	166	10	176	21	91	112	307
1976	151	12	163	59	101	160	340

	ASSUMED INTAKE		ASSUMED RELEASES		PROJECTED COUNT		ERROR
	II	III	II	III	II	III	
1977	154	163	133	149	360	354	36
1978	154	163	133	176	381	341	51
1979	154	163	133	163	401	341	62
1980	154	163	133	163	422	341	71
1981	154	163	133	163	442	341	80
1982	154	163	133	163	463	341	87

FEMALE PRISONERS WITH SENTENCES OVER ONE YEAR

	INTAKE			RELEASES			INMATES ON DECEMBER 31
	COURT	OTHER	TOTAL	PAROLE	OTHER	TOTAL	
1970	...	...	...	...	...	...	7
1971	...	...	...	...	...	...	6
1972	11	0	11	1	7	8	9
1973	6	0	6	6	5	11	9
1974	0	0	0	0	0	0	...
1975	8	5	13	...	...	4	...
1976	10	0	10	...	...	2	...

VI. MARKOV MODEL OF THE CRIMINAL JUSTICE SYSTEM

Introduction

In this chapter of the Technical Appendix we present a description of our Markov Model of the Criminal Justice System. This model is currently under development and it is envisaged that its first version will be completed and run early in Phase II of this project.

The Markov Model is a statistical model of the flow of persons through the Criminal Justice System. When completed it will produce projections of the future average levels of persons in the various sectors of the Criminal Justice System. Most importantly, it will also produce variances for these levels. These variances provide a description of the range of uncertainty in the projected quantities. We make these ideas precise in the appropriate subsections of this part of the Technical Appendix.

It is to be emphasized that the Markov Model differs in at least seven important respects from the Dynamic Modeling described in Chapter II of the Technical Appendix. These are as follows:

- The Markov Model assumes the rates of arrest, disposition, release and recidivism are fixed by a scenario. In contrast Dynamic Modeling allows policies to change according to internal conditions.

- The Markov Model produces projections in the form of average values and variances. The variances represent the spread of the projected quantities around the average values inferred by the model from its given initial conditions and probabilities.

- Many transition probabilities and levels must be estimated from the available data in order to set up the Markov Model. The statistical modeling of the techniques of our Markov Model permit one to represent one's ignorance of various initial levels in the Criminal Justice System by variances. (However, this is rather complicated to do for the transition probabilities.) These variances propogate and grow as one attempts to make predictions concerning the future.

- The Markov Model is driven by demographic projections for the entire United States and for the separate States. Dynamic Modeling is driven by projected crime rates.

- In its present form Dynamic Modeling permits feedback loops representing the response of policy-actors to the effects of their policies does not have this capability.

- The Markov Model assumes that the delays affecting flows within the model are time invariant. Dynamic Modeling allows the delays within its model to change according to internal conditions.

- The number of effects and variables included in Dynamic Modeling is greater than the number represented in the Markov Model.

The Construction of the Markov Model of the Criminal Justice System

The Markov Model of the Criminal Justice System is similar in overall conception to the Blumstein and Larson[1] model of the total Criminal Justice System and to the model constructed by Decision Dynamics Corporation and the Systems Dimensions Ltd.[2] of the Canadian prison system. Furthermore, in its use of the Markovian modeling method it is similar to the model of the prison system constructed by Gray and Pittman.[3] We shall not go into a detailed comparison of these models with the Markov Model; however, we shall mention that the computation of the process covariances (See Attachment) is original to our Markov Model of the Criminal Justice System. Indeed, no other existing model of the total Criminal Justice System yields prediction error covariances in addition to single number mean value predictions. For a useful survey of models of the criminal justice, police and related systems the reader is referred to Chaixen.[*,4]

---

[*] The Markov Model is driven by demographic projections for the entire United States and for the separate States. Dynamic Modeling is driven by projected crime rates.

In this section we outline the operation of our Markov Model of the Criminal Justice System. The reader should be aware that the basic mechanism used in this model is that of a Markov transition. The Markov transition is a random shift of a set of individuals assigned to various states or attributes at the instant t to a new set of states or attributes at the instant t+1. A precise technical description of this mechanism is given in the Attachment.

A comment is in order concerning the use of the word "state." Its use risks confusion with the term State (in the sense of State of the Union) used in the rest of the Phase I report. However, the word "state" is universally used in the relevant mathematical literature of Markov processes to describe one of the set of possible categories to which an individual can be assigned at any given instant, e.g., white and guilty. For this reason, we have chosen to use the term state in the stipulated technical sense in this chapter of the Technical Appendix.

Figure 6.1 is presented on the following page in order to facilitate the reader's understanding of the description of the operation of the Markov Model which follows.

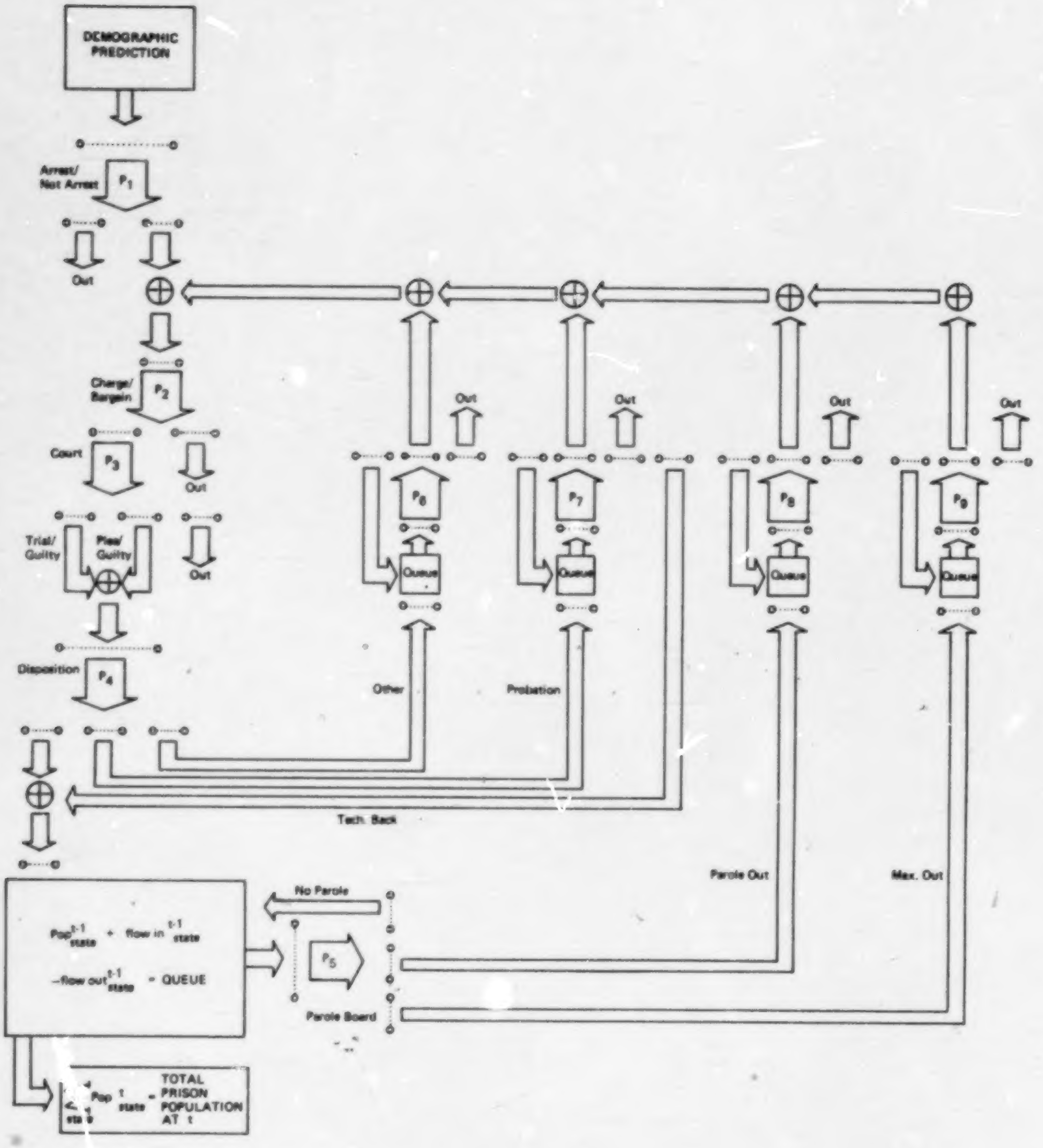
Our Markov Model is driven by projections generated by a demographic model of the population of the nation or of the appropriate geographical area or administrative group. The population prediction consists of a mean value vector and a covariance matrix and is disaggregated by age, race, sex and urbanity.

The Markov transition P_1, introduced by the model represents the probability of entering a new state, arrest or nonarrest given a set of states distinguished according to the age, sex and race characteristics of those in the general population. Those not arrested are lost to the model, as are all other individuals that land in and OUT state on the diagram. Because the population in the system is a small fraction of the population at risk (in the order of 1/1000th), this is not considered to create significant errors.

Individuals arrested from the ambient population are joined by individuals arrested during their term of probation, during the discharge of some other probation, during a period of parole, during some period after the conclusion of the parole term, or finally during some period after "maxing out" of prison. This feedback loop of individuals with histories is one of the principal dynamical aspects of the model.

The transition P_2 operates on a vector disaggregated by age, race, sex, urbanity, and previous history, and takes individuals into court or into an OUT state. Hence, an individual either arrives in court or is lost to the system.

Figure 6.1


DEMOGRAPHIC PREDICTION
Arrest/ Not Arrest
P1
Out
Charge/ Bargain
P2
Court
P3
Out
Trial/ Guilty
Plea/ Guilty
Out
Disposition
P4
Other
Probation
Tech. Back
P6
P7
P8
P9
Queue
Queue
Queue
Queue
Out
Out
Out
Out
Parole Out
Max. Out
Prison
Pop t-1 state + flow in t-1 state
−flow out t-1 state = QUEUE
No Parole
P5
Parole Board
Σ d state=1 Pop t state = TOTAL PRISON POPULATION AT t

The court transition P_3 takes an individual with the previously listed qualities out of the system or into the additional "trial guilty" state or "plea guilty" state. The individuals in those two states are then summed, preserving their original state categorization.

The disposition transition P_4 takes individuals into "probation," "parole," or "other dispostion."

The model now uses a Markov queue model for the joint action of the prison and parole board. The mean predicted prison population for any clock instant s is obtained by summing all the entries of the prison mean population state vector at s. The variance of this prediction is obtained by summing all the entries of the prison population state covariance matrix at s.

After a transition to parole or to max cut, the individual is given a state categorization only of "previous prison history." Age, race, sex, etc. are not preserved as state categorizations. This is because of the character of the data concerning future transitions of these individuals.

At the Markov queue models (See Attachment) P_6 and P_7, individuals with a "probation" or "other" disposition spend a period of time at risk. They may jump to rearrest at each clock instant. There is a positive probability they may avoid rearrest and remain in the queue until they are lost to the system after a fixed period of years.

The Markov queue model P_8 operates in an identical manner to P_6 and P_7.

The Markov queue model P_8 has the added feature that a technical violation of parole takes the individual back to prison. This group returns with a record and in the model, the individuals concerned are spread over the states of the prison population.

This completes the description of our Markov Model of the Criminal Justice System. Two remaining technical points should perhaps be mentioned:

- The model at present uses a clock instant corresponding to one calendar month. Throughout the model there are delays on various channels; for instance, a one year delay on arrival at court P_3 from charge/bargain P_2. However, we have omitted these delays in order to keep the diagram simple.

- If we had marked the diagram with time super/subscript variables for the flows in the channels we would have to have included delays as in (Figure 6.5) in the Attachment in order to make the flow diagram consistent

The Use of the Markov Model for Prediction and Policy Analysis

Consider the stochastic process $x = \{\ldots x_{t-1}, x_t, x_{t+1}, \ldots\}$. It is a standard fact that the minimum mean square estimator $\hat{x}_{t+\tau}$ of $x_{t+\tau}$ given the observations $\{\ldots x_{t-1}, x_t\}$ is given by the conditional expectation of $x_{t+\tau}$ given $\{\ldots x_{t-1}, x_t\}$, i.e.,

$$\hat{x}_{t+\tau} = \underset{|\{\ldots x_{t-1}, x_t\}}{E} x_{t+\tau}$$

Now assume x is a Markov process such that

$$x_t \xrightarrow{P_1} x_{t+1} \xrightarrow{P_2} \ldots\ldots \xrightarrow{P_\tau} x_{t+\tau}$$

(See Attachment for a precise explanation of this notation.
Then

$$\underset{|\{..x_{t-1}, x_t\}}{E} x_{t+\tau} = \underset{|x_t}{E} x_{t+\tau} = x_t P_1 P_2 \ldots P_\tau$$

gives the minimum mean square estimator of $x_{t+\tau}$. The covariance of the prediction error is given by

$$\underset{|x_t}{E} (x_{t+\tau} - \underset{1+t}{E} x_{t+\tau})^2.$$

We conclude that the minimum mean square error predictions and the associated error covariance matrices for all the processes in the Markov Model may be generated by running the model forward in time from a given set of initial state vectors, with their covariances representing measurement errors. The model is driven by a stochastic process (population) represented by a sequence of predicted mean values and prediction error covariances.

Policy analysis with the Markov Model is carried out by modifying the transition matrices P_i is Figure 6.1 in a manner which is believed to reflect policy changes. For instance, a "toughening" scenario might be generated by running the model with the probabilities in P_4 of "passage to prison," and the probabilities in P_5 of "no-parole" being increased above the "business as usual" levels.

Weaknesses of the Markov Model

It may not be the case that the parts of the Criminal Justice System represented in Figure 6.1 can be modeled as Markov Processes. By this we mean that the number of individuals making a given transition may simply not be a random variable whose distribution depends only upon the initial and final states. Further, the addition of a small number of extra states (i.e., further disaggregation) might not solve this problem.

Let us suppose that at a suitable level of disaggregation the Criminal Justice System may be adequately represented by a Markov Model. In this case, it is quite likely that the required data is not available to estimate the required transition probabilities.

It is possible that some policy dependent probabilities vary with time and the condition of the entire system in an effectively unpredictable manner.

Feedback loops may exist in the system of a form not included in the Markov Model. For instance parole boards may respond to prison overcrowding and the recent movements of judge's sentencing for a given crime. In principle, these effects can be included in the model; but, they are difficult to estimate from the available data. However, the Dynamic Modeling attempts to investigate the response of the Criminal Justice System to such effects.

There are several ways in which time series projections may be included in the model. In its present form we only use them to "drive" the model at its demographic input. However, several other methods should be considered.

Attachment: Markov Chains with Feedback

In this Attachment we first give a brief review of the notion of a finite state Markov Model. We then introduce the idea of a Markov chain and proceed to use such models as building blocks for the construction of Markovian stochastic system models involving inputs, outputs and feedback. Finally, we describe Markov queuing models.

The reader is referred to Feller[5] for all probabilistic ideas not defined in this appendix.

Finite State Markov Models

Consider a population whose members (individuals) may occupy one of k mutually exclusive states and let $n^{t}_{(i)}$ denote the number of members in state i, $1 \leq i \leq k$, at the instant t. These individuals make random jumps into one of ℓ mutually exclusive states at the instant t+1 and we denote by $m^{t+1}_{(j)}$ the number of individuals in state j, $1 \leq j \leq \ell$ at the instant t+1. For instance, at the instant t an individual might occupy the states (male, guilty), (male, not guilty), (female, guilty), (female, not guilty). In this case k = 4 and we might have, for example,

$$(n^{t}_{(1)}, n^{t}_{(2)}, n^{t}_{(3)}, n^{t}_{(4)}) = (100, 200, 50, 100).$$

At t+1 these individuals might jump to (prison) or (free). Were $\ell = 2$ then we then have the random outcome vector m^{t+1} which on one occasion might read

$$m^{t+1} = (m^{t+1}_{(1)}, m^{t+1}_{(2)}) = (100, 350).$$

Assume that the probability p_{ij} of an individual jumping from state i, $1 \leq i \leq k$, to state j, $1 \leq j \leq \ell$, depends only upon i and j and not upon the previous history of the individual or upon the histories of any other members of the population. This constitutes the Markovian assumption.

Since individuals are not lost at any transition, we have

$$\sum_{j=1}^{\ell} p_{ij} = 1 \text{ and so } P = (p_{ij})$$

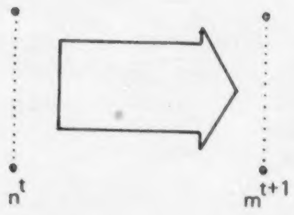
and so $P = (p_{ij})$ is a stochastic matrix. Clearly the $k \times l$ matrix P completely describes the transition probabilities from the initial to final states.

We shall call the set up described above a finite state Markov model, or Markov model, for short.

We shall denote a Markov model by the notation

$$n^{t} \longrightarrow m^{t+1}$$

The following type of diagram will also be used. The string



of small circles above n^t and m^{t+1} represent the k and ℓ distinct states that an individual may occupy at t and t+1 respectively.

It is important to observe that although we have taken n^t to be a deterministic (vector) quantity, m^{t+1} is a random (vector) quantity. The mean value $\bar{m}^{t+1}$ of m^{t+1} is given by

$$\bar{m}^{t+1} = EM^{t+1} = n^tP, \qquad (6.1)$$

where (6.1) is a row vector equation. Now it is possible to show that the covariance matrix of m^{t+1} is given by the formulae

$$\Sigma^{t+1} = E\,(m^{t+1} - \bar{m}^{t+1})^T\,(m^{t+1} - \bar{m}^{t+1}) =$$

$$\sum_{i=1}^{k} n_i^t\,\{\text{diag}\,(p_i)\} - \sum_{i=1}^{k} n_i^t\,(p_i)^T\,(p_i), \qquad (6.2)$$

where p_i denotes the i-th row of P and diag (p_i) denotes the diagonal matrix whose (j,j)-th terms is p_{ij}. We note that the (r,s)-th entry of the covariant matrix Σ^{t+1} is also given by

$$\left\{\Sigma^{t+1}\right\}_{r,s} = \sum_{i=1}^{k} \bar{n}_i^t\,(p_{ir}\delta_{rs} - p_{ir}p_{is}), \qquad (6.3)$$

where $\delta_{rs} = 1$ if r=s and 0 otherwise. These and related formulae are to be found in Bartholomew.[6]

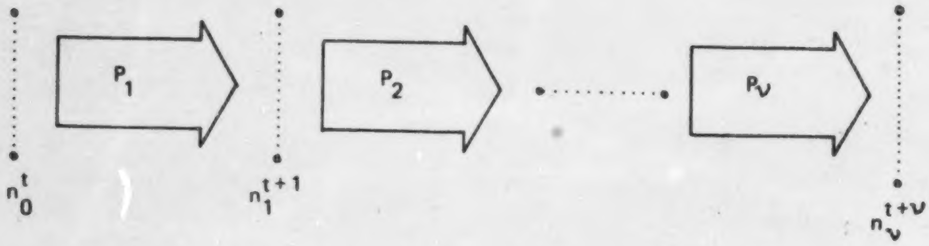
Markov Chains

We now elaborate the basic Markov model by considering a chain of such models. We denote this situation by

$$n_o^t \xrightarrow{P_1} n_1^{t+1} \xrightarrow{P_2} \quad \cdots\cdots \xrightarrow{P_\nu} n_\nu^{t+\nu}, \qquad (6.4)$$

where n_i^t denotes the (random) vector of the population occupying the k_i distinct states of the i-th state space S_i at the instant t. We call such a set-up a Markov chain. In our pictorial representation, it appears as

Figure 6.2



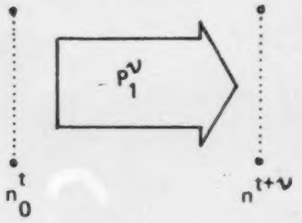
We shall take the population n_0^t to be replenished at each t; and so, we consider the transitions in (6.4 and Figure 6.2) to be taking place at every instant t. This opens the possibility of making the Markov transition matrices $\{P_i, 1 \leq i \leq \nu\}$ time-dependent; but, we shall not consider this extension for the present.

Clearly, a special case of the chain systems introduced above is the case where the state space S_{t+1} at the t+1-th instant is identical to the state space S_t at the t-th instant; i.e., we have

$$\ldots\ n^t \xrightarrow{P} n^{t+1} \xrightarrow{P} \ldots \xrightarrow{P} n^{t+\nu} \longrightarrow \ldots \qquad (6.5)$$

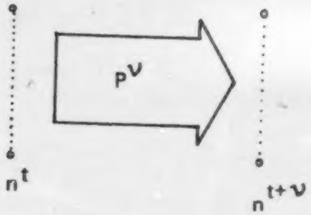
It is straightforward to show that the transition matrix between the state spaces S_0 and S_ν (6.4) is given by $P_1^\nu = P_1P_2\ldots P_\nu$. Consequently, the mean covariance of $n_\nu^{t+\nu}$, given n_0^t, may be obtained by substituting P_1^ν in the equations (6.1) and (6.2). We have, in effect, reduced (Figure 6.2) to

Figure 6.3



and reduced (6.5) to

Figure 6.4



for all $\nu \geq 0$.

In case n_0^t is a random (vector) variable with mean $\bar{n}_0^t$ and covariance Σ_0^t, we may also compute the mean and covariance of n_1^{t+1}. This mean is given by

$$\bar{n}_1^{t+1} = En_1^{t+1} = \bar{n}_0^t \, P_1 \tag{6.6}$$

and the covariance by

$$\left\{\Sigma_1^{t+1}\right\}_{r,s} = \sum_{i=1}^{k_1} \bar{n}_{0,1}^t \left(p_{ir}^1 \, \delta_{rs} - p_{ir}^1 p_{is}^1\right) \tag{6.7}$$

$$+ \sum_{i=1}^{k_1} \sum_{j=1}^{k_1} p_{ir}^1 p_{js}^1 \left\{\Sigma_0^t\right\}_{i,j},$$

where $n_{0,i}^t$ denotes the i-th entry of n_0^t and p_{ij}^1 denotes the (i,j)-th entry of P^1.

From (6.6), one immediately obtains

$$\bar{n}_\nu^{t+\nu} = \bar{n}_0^t \; P_1 P_2 \ldots P_\nu . \tag{6.8}$$

The recursion for Σ_1^{t+1}, Σ_2^{t+2}, ... $\Sigma_\nu^{t+\nu}$ is more complicated, but it should be noticed that the joint equations for

$$\left(\bar{n}_{i+1}^{t+i+1} \, , \; \Sigma_{i+1}^{t+i+1}\right)$$

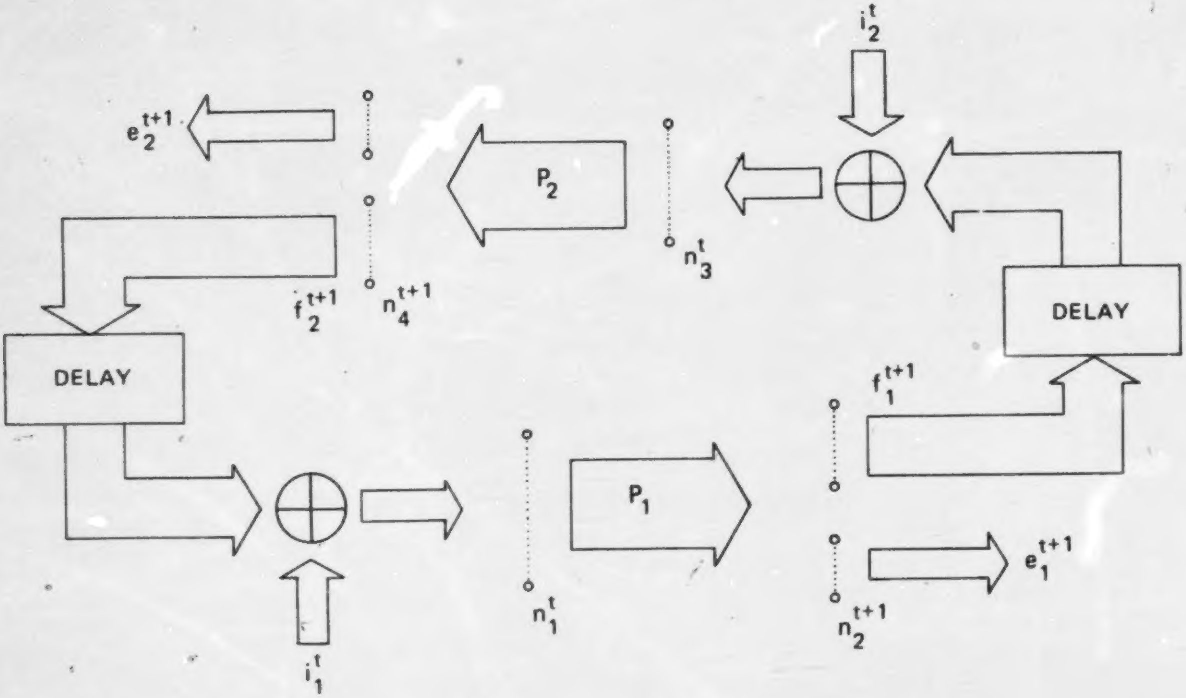
are linear in the quantities

$$\left(\bar{n}_i^{t+i}, \Sigma_i^{t+1}\right)$$

Markov Chains with Inputs, Outputs, and Feedback

Consider a Markov chain with four distinct state spaces, S_1, S_2, S_3, S_4. The populations n_1^t, n_2^t, n_3^t, n_4^t residing in these state spaces are related by the Markov chain in the manner shown in the diagram following:

Figure 6.5



This diagram represents a Markov chain with input processes (i.e., time sequences of random vector variables) i_1^t, i_2^t; output processes e_1^{t+1}, e_2^{t+1}, and feedback processes f_1^t. f_2^t. These are related by the following equations:

$$n_1^t = i_1^t + f_2^t \tag{6.9}$$

$$n_3^t = i_2^t + f_1^t \tag{6.10}$$

$$n_3^t \xrightarrow{P_2} n_4^{t+1} \tag{6.11}$$

$$n_1^t \xrightarrow{P_1} n_3^{t+1} \tag{6.12}$$

$$e_1^{t+1} = n_2^{t+1} \begin{bmatrix} I \\ 0 \end{bmatrix}_{1,1} \tag{6.13}$$

$$f^{t+1} = n_2^{t+1} \begin{bmatrix} 0 \\ I \end{bmatrix}_{1,1} \tag{6.14}$$

$$e_2^{t+1} = n_4^{t+1} \begin{bmatrix} I \\ 0 \end{bmatrix}_{m,m} \tag{6.15}$$

$$f_2^{t+1} = n_4^{t+1} \begin{bmatrix} 0 \\ I \end{bmatrix}_{m,m} \tag{6.16}$$

where, in order to make (6.9) and (6.10) meaningful, we have to identify a subset of both S_4 and the i_1 input process space with the space S_1, and similarly for S_2, i_2, and S_3, and where the equations (6.13-6.16) have the effect of simply editing out parts of n_2^{t+1}, S_2, S_4 and labeling them as outputs to the system. The "delay" box in (Figure 6.5) is formally required in order to make the diagram consistent. In operation, the system simply advances all indices by 1 at each clock instant and carries out the additions, editions, and Markov transitions.

Let i_1 and i_2 be independent stochastic processes which are themselves sequences of independently identically distributed random variables with means and covariances $(\bar{i}_1^t, \Sigma_t^{i_1})$ and $(\bar{i}_2^t, \Sigma_t^{i_2})$ respectively. Then the equations (6.9-6.10) and (6.13-6.16) between random variables yield the following equations for the corresponding mean and variances:

$$\bar{n}_1^{t} = \bar{i}_1^{t} + \bar{f}_2^{t} \qquad (6.17)$$

$$\bar{n}_3^{t} = \bar{i}_2^{t} + \bar{f}_1^{t} \qquad (6.18)$$

$$\bar{e}_1^{t+1} = \bar{n}_2^{t+1} \begin{bmatrix} I_1 \\ 0 \end{bmatrix} \qquad (6.19)$$

$$\bar{e}_2^{t+1} = \bar{n}_4^{t+1} \begin{bmatrix} I_2 \\ 0 \end{bmatrix} \qquad (6.20)$$

$$\sum_{n_1}^{t} = \sum_{i_1}^{t} + \sum_{f_2}^{t} , \qquad (6.21)$$

and similarly for the covariance of n_2^t, and

$$\Sigma_{e_1}^{t+1} = \begin{bmatrix} I_{1,1} & 0 \end{bmatrix} \Sigma_{n_2}^{t+1} \begin{bmatrix} I_{1,1} \\ 0 \end{bmatrix} \qquad (6.22)$$

and similarly for the covariances of f_1^{t+1} , e_2^{t+1}, and f_2^{t+1} respectively.

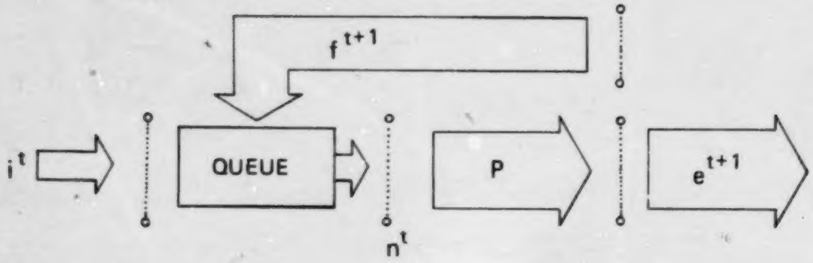
We now see that, given an initial set of means and covariances for n_1^t, n_2^t, and a sequence of means and covariances for the processes i_1 and i_2, it is possible to combine the formulae given above and formulae (6.6 and 6.7) to obtain the means and covariances for all the processes appearing in (Figure 6.5) for all future time instances $s \geq t$.

The closed loop Markov chain in (Figure 6.5) and its associated equations constitutes one basic building block for the Markov Model of the Criminal Justice System. The second, and final, building block is described in the next subsection.

Markov Queuing Models

This model, or device, is essentially a modified version of the closed loop Markov chain of the previous subsection. It has the diagrammatic representation

Figure 6.6



The system state n^t is stratified into various age group vectors, i.e., $n^t = (n^t_{(1,1)} \ldots n^t_{(1,k)}, n^2_{(2,1)} \ldots n^t_{(2,k)}, \ldots, n^t_{(\nu,1)} \ldots n^t_{(\nu,k)}) = (n^t_{(1)}, \ldots, n^t_{(\nu)}$; such a state vector will be referred to as the queue factor. Let n^t have a covariance matrix partitioned as

$$\Sigma^t_n = \left[\begin{array}{c:c} \Sigma^t_{n(1,1)} & \Sigma^t_{n(1,2)} \\ \hdashline \Sigma^t_{n(2,1)} & \underbrace{\Sigma^t_{n(2,2)}}_{k} \end{array}\right] \Big\} k$$

At the instant t, members of the queue either "age" or jump out of the queue (denoted by e^t). or "age" and queue (denoted by f^t). This is described by

$$n^t \xrightarrow{P} \left[f^{t+1}, e^{t+1}\right] \qquad (6.23)$$

where P has the structure

$$P = \left(\begin{array}{c:ccc} 0F_1 & 0(I-F_1) & & 0 \\ 00F_2 & 0 \; 0(I-F_2) & & 0 \\ \ddots & \ddots & & \vdots \\ 0F_{\nu-1} & & 0(I-F_{\nu-1}) & 0 \\ 00 & & 0 \quad 0 & I \end{array}\right)$$

where each row sums to 1. Notice an individual must age out of the queue after ν years.

Using the standard formulae (6.6 and 6.7), the mean and variance of (f^{t+1}, e^{t+1}) may be computed. Let the covariance of f^{t+1} be denoted Σf^{t+1}.

Finally to complete one cycle of the operation of the queue model, we instantaneously accept the input i^{t+1}; i.e.,

$$n^{t+1} = f^{t+1} + i^{t+1} \tag{6.24}$$

Notice the first k entries of f^{t+1} are zero. The means and variances are given by

$$\bar{n}^{t+1} = \bar{f}^{t+1} + \bar{i}^{t+1}$$

$$\Sigma_n^{t+1} = \begin{pmatrix} \Sigma_i^{t+1} & 0 \; .... \; 0 \\ 0 & \\ \vdots & \Sigma_f^{t+1} \\ 0 & \end{pmatrix}$$

VI. NOTES

1. A. Blumstein and R. Larson, "Models of a Total Criminal Justice System," Operations Research, 17(1969), 199-232.

2. Decision Dynamics Corporation and Systems Dimensions Ltd., "Federal Corrections Simulation Model: Systems Reference Manual," prepared for the Ministry of the Solicitor General of Canada (March 1976).

3. Gray and Pittman, "Evaluation of Prison Systems," Journal of Criminal Justice, 2(1974), 37-54.

4. J. Chaiken et. al, Criminal Justice Models: An Overview (Santa Monica, Calif.: Rand Corporation, 1975).

5. W. Feller, An Introduction to Probability Theory and Its Applications (3rd ed.: New York: John Wiley, 1968).

6. D.J. Bartholomew, Stochastic Models for Social Processes (2nd ed.: New York: John Wiley, 1973).

★ U. S. GOVERNMENT PRINTING OFFICE : 1977 260-992/4030